SONY

UHF SYNTHESIZED DIVERSITY TUNER

WRR-800A

SERVICE MANUAL

AU Model

⚠ WARNING

This manual is intended for qualified service personnel only.

To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

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This section is extracted from operation manual

SONY

3-860-929-**31** (1)

UHF Synthesized Diversity Tuner

Operating Instructions

WRR-800A

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AU

Precautions

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

On operation

- The unit must be used within a temperature range of 0°C to 40°C (32°F to 104°F). Avoid using the unit for extended periods at extremely high temperatures or placing it in direct sunlight, especially outdoors because this may damage the finish of the case. Never install the unit on or near a heat source, such as lighting equipment or power amplifiers.
- To avoid using in very humid or dusty places, because such use may shorten the life of the unit.
- To avoid degradation of the signal-to-noise ratio, do not use the unit in noisy places or in locations subject to vibration, such as the following:
  - — near electrical equipment, such as motors, transformers or dimmers
  - — near air conditioning equipment or places subject to direct air flow from an air conditioner
  - — near public address loudspeakers
  - — where adjacent equipment might knock against the unit
- Switching lights on or off may produce electrical interference over the entire frequency range. Position the unit and the wireless microphones so that interference is minimized.
- The unit is precisely adjusted at the factory and no adjustment before use is necessary. Do not touch the inside of the unit or try to repair it by yourself.

On cleaning

Clean the unit with a dry, soft cloth. Never use thinner, benzene, alcohol or any other chemicals, since these may damage the finish.

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Overview

The WRR-800A is a reliable UHF synthesized diversity tuner for the 800-MHz-band Sony UHF wireless microphone system which uses the frequency bands allocated for UHF TV broadcasting.
This unit is designed to enable simultaneous use of multiple channels when channels are selected according to the Sony channel plan.

Features

Phase Locked Loop (PLL) synthesized system

The WRR-800A has a refined phase locked loop (PLL) synthesizer circuit and covers two UHF TV channels. It operates on 102 channels over a 14-MHz frequency.

Preprogrammed wireless channel plan for simultaneous multichannel operation

The WRR-800A has many preprogrammed, easily settable channels in a simultaneous multichannel operation. One group allows setting of 102 channels. The unit also has 12 preset groups of channels, each of which permits , simultaneous operation of 5, 6, 8, 9 or 12 channels without the effects of intermodulation.

Versatile display

A liquid-crystal display provides a variety of information, including the levels of the reception channels, RF information and transmitter battery condition.

Space diversity reception system

The WRR-800A provides stable signal reception with minimum dropout.

Tone squelch circuit for noise elimination

A built-in squelch circuit eliminates noise and signal interference when the WRR-800A is in signal reception standby mode.

Compander system

A compander (compressor/expander) system enables stabilized wireless transmission over a wide dynamic range.

System Configuration

The unit can be used with a Sony UHF synthesized wireless microphone or UHF synthesized transmitter among the models listed in the table below.

Sony 800 MHz-band system models

Frequency band		**Model name**	
TV channel	Frequency (MHz)	Transmitter or microphone	Tuner
66	792.250 to 798.500	**WRT-800A (66)** **WRT-805A (66)** WRT-810A (66) WRT-820A (66) WRT-830A (66) WRT-860A (66) WRT-867A (66)	**WRR-800A (66)** **WRR-801A (66)** WRR-810A (66) WRR-820A (66) WRR-840A (66) WRR-850A (66) WRR-860A (66)
67	799.250 to 805.500		

Wirelss Channels Selectable

The unit stores 13 groups of selectable channels: groups 00 (102 channels), 11 (12 channels), 12 (9 channels), 13 (9 channels), A1 (8 channels), A2 (6 channels), A3 (6 channels), L1 (6 channels), L2 (6 channels), M1 (6 channels), M2 (5 channels), H1 (8 channels) and H2 (8 channels).
Channel groups other than group 00 are designed so that all channels of one group can be used simultaneously within the same UHF wireless microphone system without causing intermodulation. It is therefore recommended that you usually use a channel group other than group 00 unless the use of group 00 is specifically necessary.
Each “wireless channel” is represented by a 2-digit TV channel number and a 2-digit number, for example: 66-23.

Note

To eliminate interference or noise, please note the following.

- Do not use two or more wireless microphones or transmitters whose wireless channels are the same.
- If there is a TV broadcasting station nearby, to avoid possible interference from its broadcasting, do not use that station’s channel.
- The number of wireless microphone channels actually usable in a multi-channel system may be smaller than the normal capacity of that system if there is interference from TV broadcasting or other RF signals.
- When operating two or more UHF wireless microphone systems using the same wireless channel in the same group, ensure that the systems are at least 100 m (330 feet)[1)] apart as far as they are installed within sight of each other.

1) The distance depends on the operating environment and conditions.

Wireless Channel Lists

Group 00: All channel access
Use only for a one-channel system or to scan for open channels.

WL Channel	Frequency (MHz)	WL Channel	Frequency (MHz)
66-01	792.250	66-27	795.500
66-02	792.375	66-28	795.625
66-03	792.500	66-29	795.750
66-04	792.625	66-30	795.875
66-05	792.750	66-31	796.000
66-06	792.875	66-32	796.125
66-07	793.000	66-33	796.250
66-08	793.125	66-34	796.375
66-09	793.250	66-35	796.500
66-10	793.375	66-36	796.625
66-11	793.500	66-37	796.750
66-12	793.625	66-38	796.875
66-13	793.750	66-39	797.000
66-14	793.875	66-40	797.125
66-15	794.000	66-41	797.250
66-16	794.125	66-42	797.375
66-17	794.250	66-43	797.500
66-18	794.375	66-44	797.625
66-19	794.500	66-45	797.750
66-20	794.625	66-46	797.875
66-21	794.750	66-47	798.000
66-22	794.875	66-48	798.125
66-23	795.000	66-49	798.250
66-24	795.125	66-50	798.375
66-25	795.250	66-51	798.500
66-26	795.375		

Channel	Frequency (MHz)	Channel	Frequency (MHz)
67-01	799.250	67-27	802.500
67-02	799.375	67-28	802.625
67-03	799.500	67-29	802.750
67-04	799.625	67-30	802.875
67-05	799.750	67-31	803.000
67-06	799.875	67-32	803.125
67-07	800.000	67-33	803.250
67-08	800.125	67-34	803.375
67-09	800.250	67-35	803.500
67-10	800.375	67-36	803.625
67-11	800.500	67-37	803.750
67-12	800.625	67-38	803.875
67-13	800.750	67-39	804.000
67-14	800.875	67-40	804.125
67-15	801.000	67-41	804.250
67-16	801.125	67-42	804.375
67-17	801.250	67-43	804.500
67-18	801.375	67-44	804.625
67-19	801.500	67-45	804.750
67-20	801.625	67-46	804.875
67-21	801.750	67-47	805.000
67-22	801.875	67-48	805.125
67-23	802.000	67-49	805.250
67-24	802.125	67-50	805.375
67-25	802.250	67-51	805.500
67-26	802.375		

Group 11: 12-channel group
Use when TV channels both 66 and 67 are available.

WL Channel	Frequency **(MHz)**
66-02	792.375
66-07	793.000
66-17	794.250
66-19	794.500
66-35	796.500
66-43	797.500
67-08	800.125
67-19	801.500
67-33	803.250
67-39	804.000
67-42	804.375
67-46	804.875

Group 12: 9-channel group
Use when TV channel 66 is on the air.

WL Channel	Frequency **(MHz)**
67-01	799.250
67-03	799.500
67-11	800.500
67-16	801.125
67-23	802.000
67-27	802.500
67-41	804.250
67-44	804.625
67-50	805.375

Group 13: 9-channel group
Use when TV channel 67 is on the air.

WL Channel	Frequency **(MHz)**
66-01	792.250
66-03	792.500
66-11	793.500
66-16	794.125
66-23	795.000
66-27	795.500
66-41	797.250
66-44	797.625
66-50	798.375

Group A1: 8-channel group
Use when both TV channels 66 and 67 are available.

WL Channel	Frequency **(MHz)**
66-02	792.375
66-04	792.625
66-12	793.625
66-24	795.125
67-02	799.375
67-29	802.750
67-35	803.500
67-44	804.625

Group A2: 6-channel group
Use when TV channel 66 is on the air.

WL Channel	Frequency **(MHz)**
67-06	799.875
67-15	801.000
67-21	801.750
67-32	803.125
67-46	804.875
67-50	805.375

Group A3: 6-channel group
Use when TV channel 67 is on the air.

WL Channel	Frequency **(MHz)**
66-06	792.875
66-15	794.000
66-21	794.750
66-32	796.125
66-46	797.875
66-50	798.375

Wirelss Channels Selectable

Group L1: 6-channel group
Use when TV channel 67 is on the air.

WL Channel	Frequency **(MHz)**
66-01	792.250
66-03	792.500
66-09	793.250
66-14	793.875
66-18	794.375
66-21	794.750

Group M1: 6-channel group
Use when TV channel 67 is on the air.

WL Channel	Frequency **(MHz)**
66-31	796.000
66-33	796.250
66-39	797.000
66-44	797.625
66-48	798.125
66-51	795.500

Group H1: 8-channel group
Use when TV channel 66 is on the air.

WL Channel	Frequency **(MHz)**
67-03	799.500
67-05	799.750
67-11	800.500
67-16	801.125
67-26	802.375
67-35	803.500
67-38	803.875
67-42	804.375

Group L2: 6-channel group
Use when TV channel 67 is on the air.

WL Channel	Frequency **(MHz)**
66-02	792.375
66-04	792.625
66-10	793.375
66-15	794.000
66-19	794.500
66-22	794.875

Group M2: 5-channel group
Use when TV channel 67 is on the air.

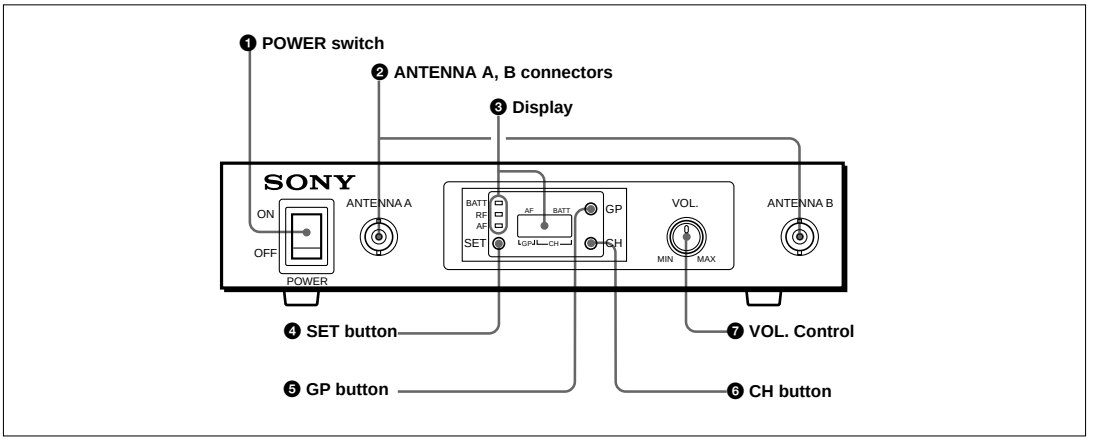
WL Channel	Frequency **(MHz)**
66-32	796.125
66-34	796.375
66-40	797.125
66-45	797.750
66-49	798.250

Group H2: 8-channel group
Use when TV channel 66 is on the air.

WL Channel	Frequency **(MHz)**
67-06	799.875
67-08	800.125
67-12	800.625
67-22	801.875
67-25	802.250
67-33	803.250
67-40	804.125
67-45	804.750

Location of Parts and Controls

Front Panel



❶ POWER switch
Turns the power on and off.

❷ ANTENNA A, B (antenna A, B) connectors (BNC type)
Connect the supplied antennas.

❸ Display
Displays the status of this unit and the groups and channels assigned to the unit.

For details, see the following section "Display".

❹ SET button
Press to change the group or channel.

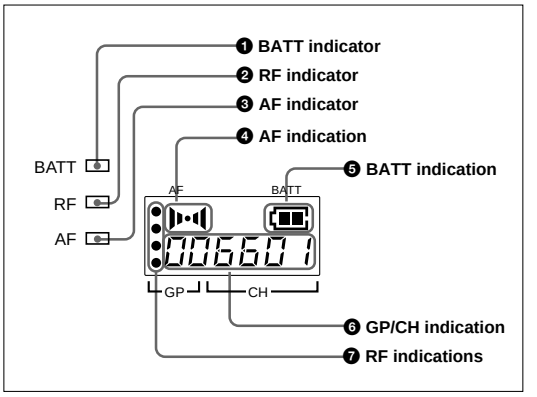
Location of Parts and Controls

❺ GP (group) button
Press to change the group or to display frequencies.

❻ CH (channel) button
Press to change the channel in a group.

❼ VOL. (volume) control
Adjusts the volume of the tuner output.

Display



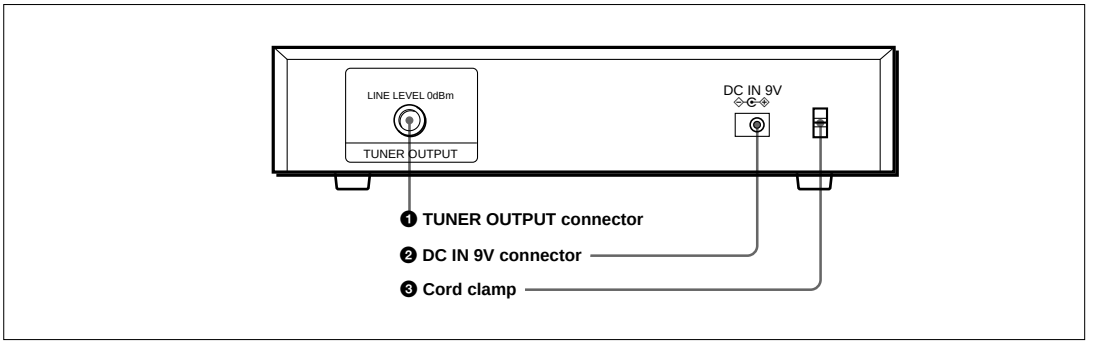
❶ BATT (battery) indicator
❺ BATT (battery) indication
Indicate the condition of the wireless microphone transmitter batteries. The indicator and indication start flashing about one hour before the transmitter batteries go flat.

❷ RF (radio frequency) indicator
❼ RF (radio frequency) indications
The indicator lights and the indications (dots) appear when the antenna reception is optimal. Depending on the RF input level, the number of dots changes.

❸ AF (audio frequency) indicator
❹ AF (audio frequency) indication
The indicator lights and the indication appears when the audio output level is higher than the reference level.

❻ GP/CH (group/channel) indication
Shows the reception channel group and respective channel number.
Pressing the GP button changes this indication to the frequency indication.

Rear Panel

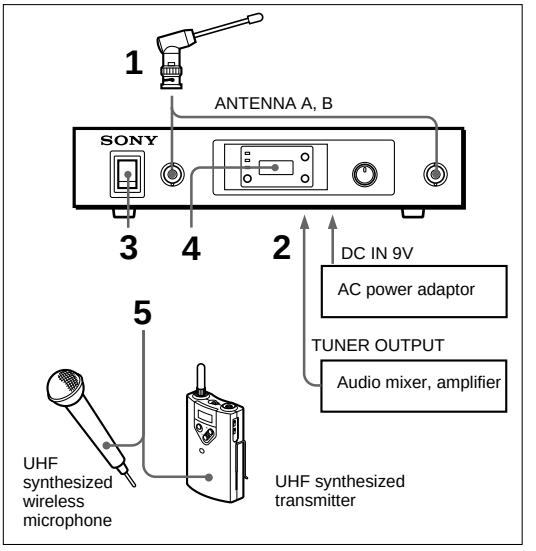


❶ TUNER OUTPUT (tuner sound output) connector (ø6.3 phone balanced (1/4 inch TRS))
Supplies audio signals. You can connect this to the audio input connector of a mixer, amplifier, or similar equipment.

❷ DC IN 9V (9 V DC power input) connector
Connect the supplied AC power adaptor.

❸ Cord clamp
Attaches the cord of the AC power adaptor.

Operation



1 Connect the supplied antennas and make the antenna tips point upward.

2 Connect the supplied AC power adaptor to the DC IN 9V connector and an audio mixer or amplifier to the TUNER OUTPUT connector.

3 Turn the POWER switch on.

Note

Turn the POWER switch on after reducing the volume of the equipment connected to the TUNER OUTPUT connector. Otherwise, noise will be heard when the POWER switch is turned on.

4 Set the reception channel.

For details on setting the channels, see page 13.

5 Turn on the wireless microphone or transmitter.
Use the wireless microphone or transmitter to which the same channel is assigned as to this unit.

If noise is heard

Depending on the environment where the system is installed, outside noise or radio wave may disrupt the transmission of certain channels.
To select a channel under this circumstance, turn off the wireless microphone or transmitter. Then select a channel at which the RF indicator is off. (A channel free from noise or radio wave interference is selected.) Set the same channel on the microphone or transmitter.

Muting Functions

This unit has the following three muting functions, which work in combination.

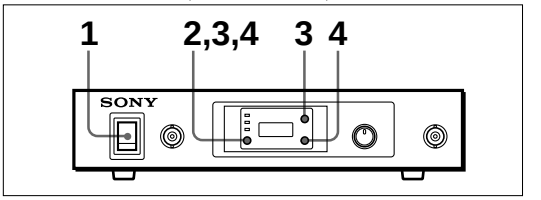
(1) Muting by RF input level
As sufficient S/N for the audio output may not be obtained if no RF signal is received or the RF input level is low, the audio output can be muted when the RF input level falls below the muting level.

(2) Tone squelch
The audio output is obtained only when the unit receives an RF signal which includes a specified tone signal. The audio output is muted to eliminate noise which may be heard when the transmitter is turned on/off or the unit receives an interference RF signal.

(3) Noise squelch
The audio output is muted to eliminate noise which may be heard when there is such excessive interference RF signal that the tone squelch does not work.

Channel Setting

Take the following precautions to prevent interference and noise.
- Do not simultaneously use two or more microphones and transmitters that are set to the same channel.
- When simultaneously using two or more tuners, always set the tuners to different channels within the same group (other than group 00).
- Separate the reception antennas and the transmitter by more than 3 meters (9 feet 11 inches).



1 Turn the POWER switch on.

The message “AS 66” appears on the display, and then the current status of this unit is displayed.

(Continued)

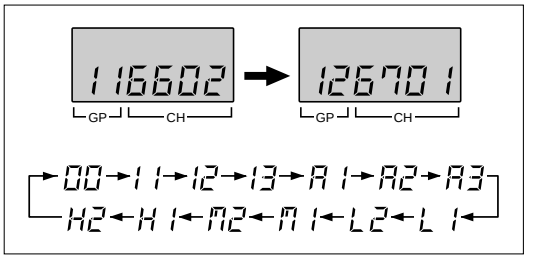
Channel Setting

Note
Turn the POWER switch on after reducing the volume of equipment connected to the TUNER OUTPUT connector. Otherwise, noise will be heard when the power is turned on.

2 Press the SET button and hold it down.

The unit changes to the group and channel selection mode.

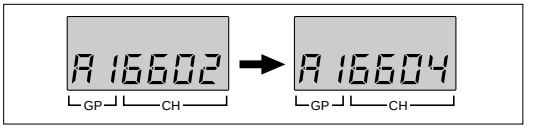
3 While holding down the SET button, press the GP button to select a group.
Each time you press the GP button, the GP indication changes as shown in the following figure. To change the indication continuously, press and hold down the GP button.



The CH indication shows the lowest frequency channel of the selected group. For group 00, however, the channel selected last is displayed.
Releasing the buttons automatically cancels the group selection mode, and the currently displayed group is selected.

4 While holding down the SET button, press the CH button to select a channel.

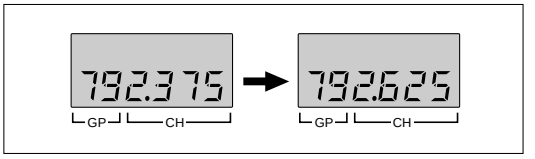
Similar to step **3**, each time you press the CH button, the CH indication changes in the order shown in the group and reception channel list. *(See “Wireless Channel Lists” on page 6.)*
If you press the CH button when the last channel of the selected group is displayed, the first channel of the group will be displayed.



Selecting the reception channel by frequency
Press the GP button.

This changes the GP/CH indication to a frequency indication.

To change a frequency, press the CH button while keeping the SET button pressed. (A higher frequency will be displayed.)
Press the GP button again to change the frequency indication back to a GP/CH indication.



5 If the desired channel or frequency is displayed, release the SET button and CH button.

The selected channel is set.

To store the selected group and channel

Leave the indication unchanged for 5 seconds.
The group and channel set in the procedure explained above are stored in memory.

Error Messages

Apart from the normal indications, the following error messages may appear on the display.

Message	Meaning	Remedy
Err 01	An error has occurred in the backup memory data.	The memory data is initialized. Reset the group and channel settings.
Err 02	The PLL-synthesized circuit has a malfunction.	Contact your nearest Sony dealer.
NO TONE	As no tone signal is available or a tone signal other than 32.768 kHz is being received, the audio signal output is muted.	The transmitter's tone signal is in trouble. Contact your nearest Sony dealer. If you are using a WRT-810A wireless microphone, a "NO TONE" message appears when you turn off the AF switch, but this is normal.

Specifications

Tuner

Reception type 110KF3E
Circuit system Dual conversion superheterodyne
Reception frequencies
792.250 to 805.500 MHz
Local oscillators
Crystal controlled PLL synthesizer
Selectivity 60 dB or more (at ±250 kHz detuned)
Spurious rejection ratio
70 dB or more
Image rejection ratio
70 dB or more
Muting level 30 dBμ[1)]
Antenna connectors
BNC-R type (2), 50 ohms
Frequency response
100 to 15,000 Hz ±3 dB
De-emphasis 50 μsec
Signal-to-noise ratio
30 dB or more at an A-weighted RF input level of 20 dBμ
60 dB or more at an A-weighted RF input level of 60 dBμ
(±5.0 kHz deviation at 1 kHz modulation)
Distortion 1% or less (±40 kHz deviation at 1 kHz modulation)
Tone signal frequency
32.768 kHz
Output level 0 dBm[2)] (±16 kHz deviation at 1 kHz modulation)
(–20 dBm (±5 kHz deviation at 1 kHz modulation))
Output impedance
150 ohms
Output connector
ø6.3 phone balanced (1/4 inch TRS)

1) 0 dBμ=1 μV
2) 0 dBm=0.775 Vrms (600 ohms loaded)

General

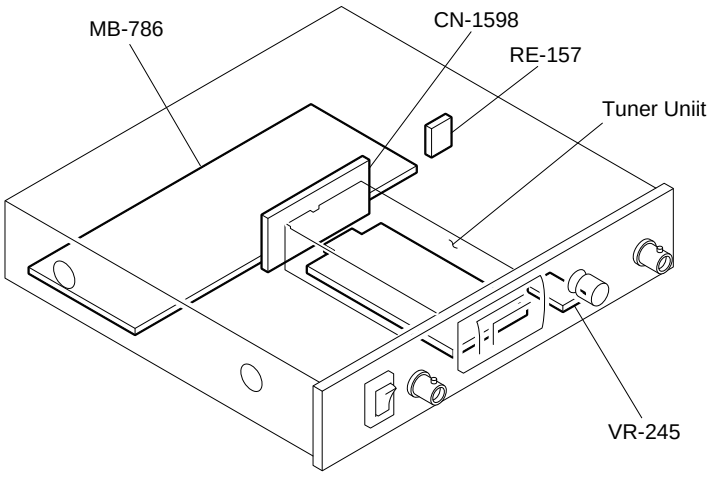
Power requirements
9 V DC
Current consumption
Approx. 500 mA
Operating temperature
0°C to 40°C (32°F to 104°F)
Storage temperature
–20°C to +55°C (–4°F to +131°F)
Dimensions 218 × 44 × 210 mm
(8 5/8 × 1 3/4 × 8 3/8 inches) (w/h/d)
Mass Approx. 1.6 kg (57 oz)
Accessories supplied
AC power adaptor (1)
Antennas (2)
Operating Instructions (1)

Design and specifications are subject to change without notice.

Printed in Japan

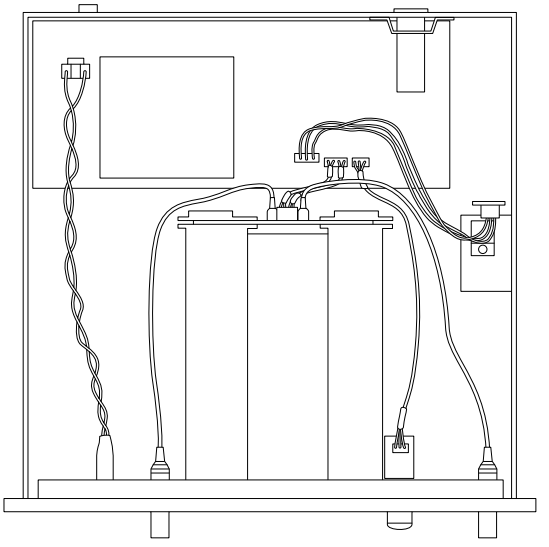
SECTION 2
SERVICE OVERVIEW

2-1. BOARDS LOCATION



2-2. PRECAUTION IN WIRING HARNESS

- The harness inside the WRR-800A are laid out so that they are not positioned close to the heat-producing parts or high voltage present parts by routing the harnesses properly or using purse locks.
  Therefore, when the boards are replaced (or parts are replaced), be sure to return the harnesses to their original locations (see the following illustration).
- When replacing a board (or when replacing a part), turn the POWER switch OFF , and unplug the power cord from the AC inlet.



2-3. ERROR MESSAGES

The following error messages will appear if an error is detected by the built-in self diagnostics function of the WRR-801A (or WRR-800A).

Error	Comments	Countermeasure
Massage		
Error 01	Error the backup memory	Because data is initialized, perform the group setting, channel setting again. Replace the tuner unit then perform “3. Electrical Alignment” if there is an error message even when the setting had been completed again.
Error 02	PLL synthesizer circuit failed	Malfunction of tuner unit. Replace the tuner unit then perform “3. Electrical Alignment”.
NO TONE	The tone signal is present, or audio signal output is muted because the receiver received a tone signal other than 32.768 kHz signal.	Malfunction of transmitter or receiver (WRR-800A) To check the characteristics, perform “3-2-2. Overall Characteristic Confirmation.” If there are out of characteristics, tuner unit may defect. Replace the tuner unit then perform “3. Electrical Alignment.”

2-4. SERVICE FUNCTION

Set or release the following functions by operating the button on the front panel of the WRR-800A.

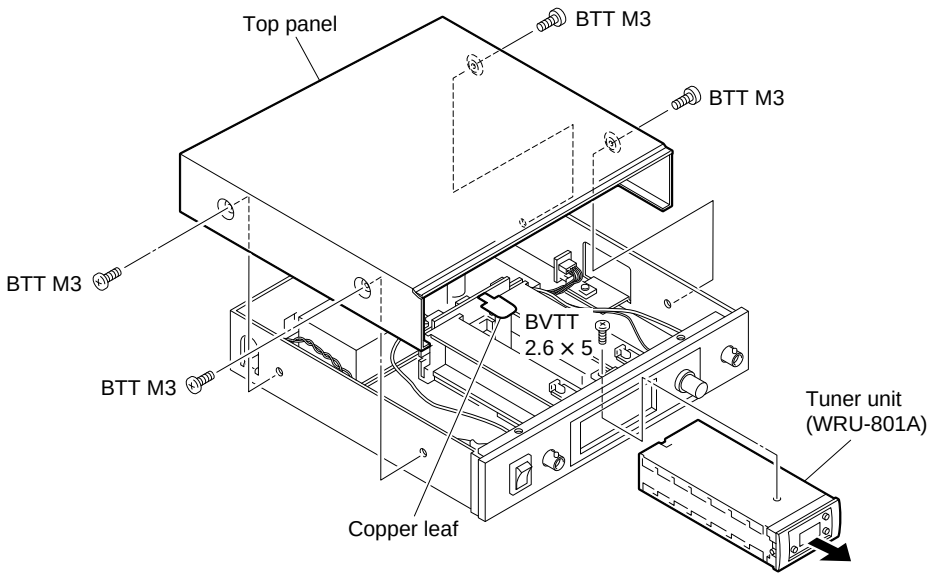
• Setting / Release of Muting Function

Function	Setting / Release
・Muting OFF by RF signal input level ・Muting OFF by tone squelch ・Muting OFF by noise squelch	Muting OFF mode setting: When pressing the “GP” and “CH” buttons, turn ON the POWER switch.
	Muting OFF mode releasing (Normal operation mode): Turn OFF the POWER switch.

Default Factory Setting : Muting OFF mode is released (Normal mode).

2-5. TUNER UNIT REMOVAL

1. Remove the four screws (BTT M3) from the side panel, and remove the top panel.
2. Remove the screw (BVTT2.6 × 5).
3. Desolder the copper leaf from the lid of the tuner unit.
4. Pull out the tuner unit in the arrow direction.



2-6. SERVICE INFORMATION OF TUNER UNIT

There are no component level service available for the WRR-800A's tuner unit (compatible with WRU-801A) except the followings. Therefore, be sure to replace whole tuner unit WRU-801A when make a servicing in the component level (Refer to following "TUNER UNIT CHECKING").

Available parts for the tuner unit

Part No.	SP	Description
A-8317-231-A	s	F case assembly
A-8317-232-A	s	LCD assembly
1-783-026-11	s	Flat cable (33 wires)
2-545-180-01	s	Lid

TUNER UNIT CHECKING

The following procedures describe how to prove the tuner unit of WRR-800A (repair unit) whether it needs to be repaired or not.

Equipment Required : WRR-801A(quality unit)

(1) Install the repair tuner unit to be examined in a quality WRR-801A.
(2) Check the fault with a quality WRR-801A.
- If there is no fault, it is considered that the tuner unit is no longer defective.
  Restore the tuner unit to its original WRR-800A (repair unit). Check all components other than the tuner unit, such as MB-786 board, CN-1598 board, harness, etc., then fix a faulty section.

- If there is a fault, tuner unit is defective.
  To fix the tuner unit, perform "3. Electrical Alignment." If it is impossible to fix the tuner unit, replace it with a new tuner unit (WRU-801A).

(3) In order to prove the whole WRR-800A, change the tuner unit of the repairing WRR-800A with tuner unit of WRR-801A(quality unit).
(4) Check the fault of repairing WRR-800A.
- If there is no fault found on the repairing WRR-800A, tuner unit is defective.

- If there is a fault, it is considered that both the tuner unit and other components, such as MB-768 board, CN-1598 board, harness, etc., are defective. Check all components then fix a faulty section.

SECTION 3
ELECTRICAL ALIGNMENT

3-1. PREPARATION

3-1-1. Equipment and Tools

Equipment

Name	Specifications		Model name
DC power supply	+9 Vdc output		—
Signal generator	Frequency:	100 kHz to 990 MHz	HEWLETT PACKARD 8656B or equivalent
Spectrum analyzer	Frequency:	10 kHz to 5 GHz	ADVANTEST TR4173 or equivalent
DC volt meter (Multi Meter)	Effective digits:	3 1/2 digits	—
Audio analyzer	Frequency:	10 Hz to 100 kHz	HEWLETT PACKARD 8903B equivalent
RF millivolt meter	Frequency:	10 kHz to 1000 MHz	MEGURO MV-19B, C (with 50 Ω termination prove chip MP-3109) or equivalent
Level meter	Frequency:	20 Hz to 100 kHz	—
Noise meter	Frequency: 10 Hz to 500 kHz Filter (included): A weighted filter		MEGURO MN-445B or equivalent
Tracking generator	Frequency:	100 kHz to 2 GHz	ADVANTEST TR4153A or equivalent
Function generator	32.768 kHz (and 32.782 kHz) ±1 Hz signal (sine wave) can be generated.		HEWLETT PACKARD 8904A or equivalent
Mic amp	Gain:	0 dB to 70 dB (with A weighted filter)	—
Oscilloscope	Frequency:	DC to 30 MHz	—

Tools

Name	Part No.	Remarks
Adjuster (0.4 × 1.3 mm)	7-721-052-81	For adjustment

3-2. ADJUSTMENT

This section describes the following adjustments (and checks) required to satisfy the specifications.

Adjustment Item

3-2-1. Tuner Unit Adjustment

1. Muting level and RF level adjustment
2. Output level adjustment
3. Noise squelch adjustment

3-2-2. Overall Characteristic Check

1. Output level check
2. S/N check
3. Frequency characteristic check
4. Distortion ratio check
5. RF level indicator/RF indicator check
6. AF level indicator/AF indicator check
7. Muting level check
8. BATT indicator check
9. Tone squelch check

Note

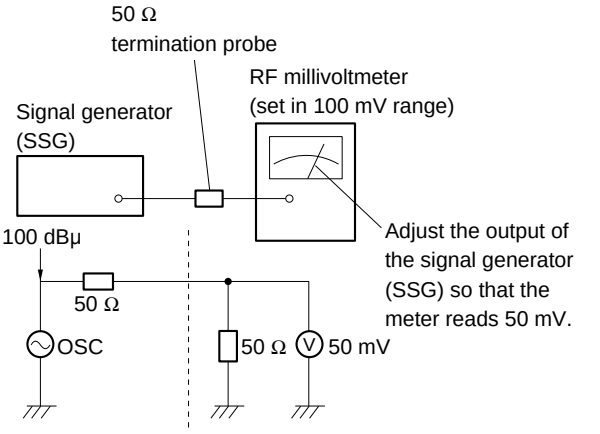
0 dBμV_{EMF} = −113 dBm
(EMF = Electromotive force)
0 dBm = 1 mW at 50 Ω loaded

Note on Adjustment

The RF level of the input signal (the output level of the signal generator) for adjustment is expressed as an open ended voltage in unit dBμ (0 dBμ = 1 μV).
The adjustment is to be performed by calibrating the output level of the signal generator as shown below.

Calibration method

(1) Connect the RF millivoltmeter to the signal generator as shown in the figure below.
(2) Adjust the level of the output signal from the signal generator (SSG) so that the RF millivolt meter reads 50 mV. The level of the output signal from the signal generator (SSG) when RF millivoltmeter reads 50 mV shall be specified as 100 dBμ (at no load).



3-2-1. Tuner Unit Adjustment

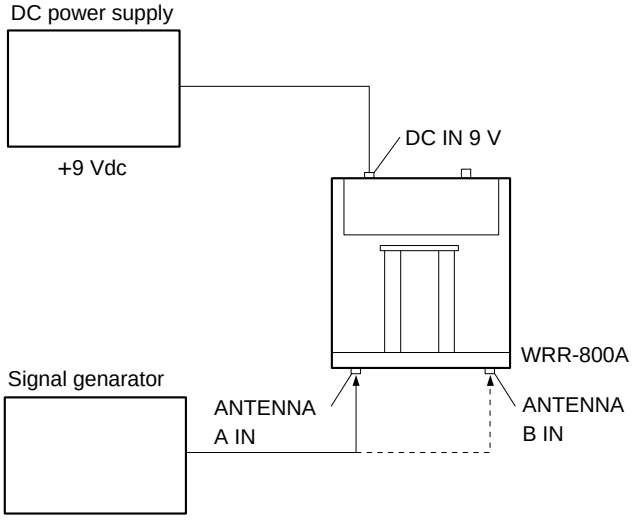
1. Muting level and RF level adjustment

Perform this adjustment when the Muting levels deviate from the specification.
This adjustment is performed automatically by the learning function of the WRR-800A RSSI learning.

Equipment and Tools

DC power supply: +9 Vdc
Signal generator

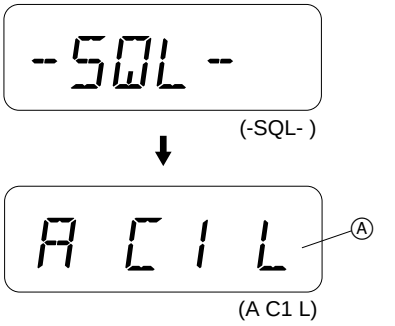
Connection



Procedure

Step 1: Preparation
Set the signal generator as follows:
Signal generator setting
FREQUENCY (Carrier frequency): 795.000 MHz
RF OUTPUT (Output level): 35 dBμVEMF
(= −78 dBm)
MODULATION (Modulation frequency):
OFF (No modulation)

Step 2: Adjustment
(1) Connect the signal generator to the ANTENNA A IN connector.
(2) Turn OFF the WRR-800A POWER switch.
(3) Set the RF OUTPUT (output level) of the signal generator to the OFF.
(4) While pressing the “SET” button on the front panel, turn on the WRR-800A POWER switch.
(5) Indication on LCD appears as follows:
LCD:

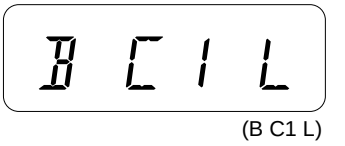


(6) Set the RF OUTPUT (output level) of the signal generator to the ON.
(7) Check first that indication “L” of “AC1L” on the LCD has disappeared, and then press the “SET” button on the front panel.

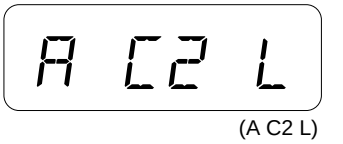
Note

If the “L” indication does not disappear from the LCD (on Ⓐ area: refer to the previous procedure (5) (when the RF input level is lower than the reference level) or “H” is displayed (when the RF input level is higher than the reference level), perform the following adjustment.
① Check the RF output level and frequency of the signal generator (perform re-setting if necessary), and repeat from procedure (1).
② If the above conditions (the “L” indication does not disappear, or “H” is displayed) remain even after re-adjustment, it is necessary to replace the new tuner unit (WRU-801A).

(8) Indication on the LCD appears as follows:
LCD:



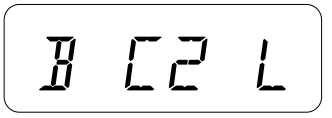
(9) Connect the signal generator to the ANTENNA B IN connector.
(10) Check first that indication “L” of “BC1L” on the LCD has disappeared, and then press the “SET” button on the front panel.
(11) Indication on the LCD appears as follows:
LCD:



(12)Connect the signal generator to the ANTENNA A connector with DC cut fixture.
Set the FREQUENCY (carrier frequency) of the signal generator as follow.
FREQUENCY (carrier frequency): 799.000 MHz

(13)Check first that indication “L” of “AC2L” on the LCD has disappeared, and then press the “SET” button on the front panel.

(14)Indication on the LCD appears as follows:
LCD:

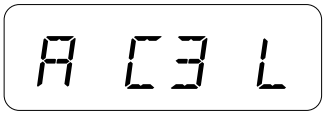


(B C2 L)

(15)Connect the signal generator to the ANTENNA B IN connector with DC cut fixture.

(16)Check first that indication “L” of “BC2L” on the LCD has disappeared, and then press the “SET” button on the front panel.

(17)Indication on the LCD appears as follows:
LCD:



(A C3 L)

(18)Connect the signal generator to the ANTENNA A connector with DC cut fixture. Set the FREQUENCY (carrier frequency) of the signal generator as follow.
FREQUENCY (carrier frequency): 804.000 MHz

(19)Check first that indication “L” of “AC3L” on the LCD has disappeared, and then press the “SET” button on the front panel.

(20)Indication on the LCD appears as follows:
LCD:

(B C3 L)

(21)Connect the signal generator to the ANTENNA B IN connector with DC cut fixture.

(22)Check first that indication “L” of “BC3L” on the LCD has disappeared, and then press the “SET” button on the front panel.

(23)Indication on the LCD appears as follows:
LCD:

(AS66)

Adjustment is completed. (Normal operation mode)

2. Output level adjustment

Perform this adjustment when the TUNER OUTPUT levels deviate from the specification.

Preparation

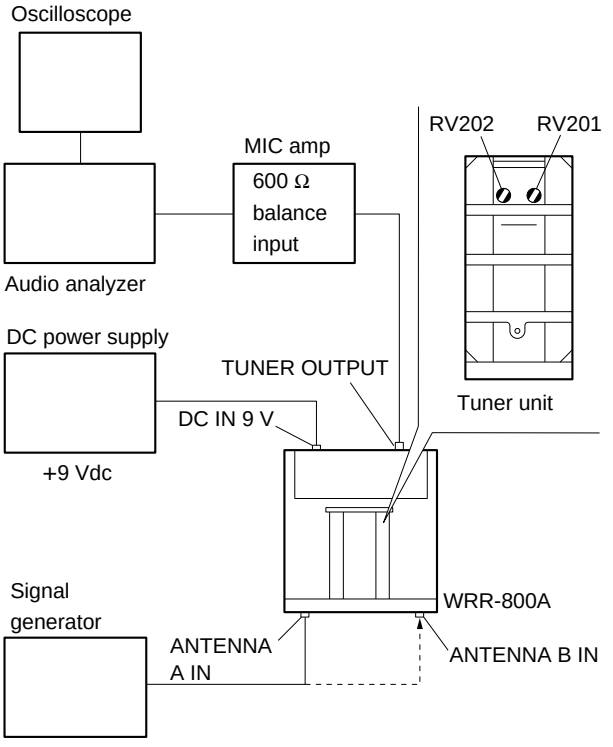
Before the adjustments, turn off the POWER switch of the WRR-800A, and perform the followings.

1. Remove the case cover of the WRR-800A.
2. Remove the tuner unit form the WRR-800A.
3. Remove the upper side case lid of the tuner unit, and insert the tuner unit to the slot of the WRR-800A.

Equipment and Tools

- DC power supply: +9 Vdc
- Audio analyzer (level meter, distortion meter)
- Mic amp (Noise meter)
- Oscilloscope
- Adjuster (0.4 × 1.3 mm): (Part No. 7-221-652-81)

Connection/Adjustment Location



Switch and Control Setting

Channel setting: Group 00, 6701 channel
(799.250 MHz)
VOL. control: MAX
Muting: OFF

Procedure

Step 1: Preparation

Set the signal generator as follows:

Signal generator setting

FREQUENCY (Carrier frequency): 799.250 MHz
RF OUTPUT (Output level): 60 dBμVEMF
(= −53 dBm)
MODULATION (Modulation frequency): 1 kHz
DEVIATION (Frequency deviation): ±5 kHz

Step 2: Adjustment

(1) Connect the audio analyzer to the TUNER OUTPUT connector via MIC amp.
(2) Connect the signal generator to the ANTENNA A IN connector.
(3) Adjustment (ANTENNA A IN side adjustment)
Specification: Output level (level meter indication level) = −20 dBm ± 0.5 dB (at 600 Ω loaded)
Adjustment: ⊘RV202/RF board (Tuner unit)
(4) Connect the signal generator to the ANTENNA B IN connector.
(5) Adjustment (ANTENNA B IN side adjustment)
Specification: Output level (level meter indication level) = −20 dBm ± 0.5 dB (at 600 Ω loaded)
Adjustment: ⊘RV201/RF board (Tuner unit)

Note

The output level difference between the ANTENNA A side and the ANTENNA should be within 0.3 dB.

Step 3:

After completing adjustment, turn off the WRR-800 A power switch and perform the followings.

(1) Remove the tuner unit from the WRR-800A.
(2) Attach the upper side case lid to the tuner unit, and insert the tuner unit to the slot of the WRR-800A.

3. Noise squelch adjustment

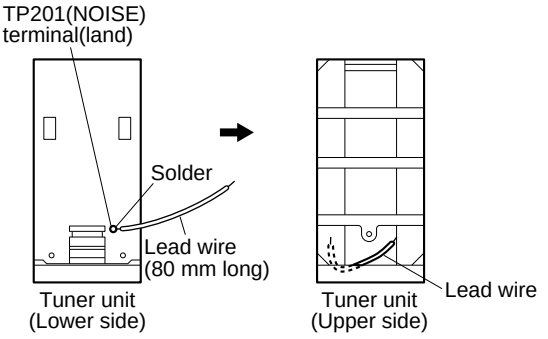
Equipment and Tools

- DC power supply: +9 Vdc
- Signal generator
- Audio analyzer (level meter, distortion meter)
- Mic amp (Noise meter)
- Oscilloscope
- Adjuster (0.4 × 1.3 mm) : (Part No. 7-221-652-81)

Preparation

Before the adjustments, turn off the POWER switch of the WRR-800A, and perform the followings.

1. Remove the case cover of the WRR-800A.
2. Remove the tuner unit from the WRR-800A.
3. Remove the upper and lower side case lids of the tuner unit.
4. Solder a wire (80 mm long) to the TP201(NOISE) terminal (land), and take out the free side of the wire (80 mm long) to the upper side of the tuner unit as below.



5. Attach the lower side case lid to the tuner unit, and insert the tuner unit to the slot of the WRR-800A.

Connection

Same as " 2. Output level adjustment ".

Switch and Control Setting

Channel setting: Group 00, 6701 channel (799.250 MHz)
VOL. Control: MAX
Muting: OFF

Procedure

Step 1: S/N check

Perform the " 2. S/N Check " of Section 3-2-2. Overall Characteristics Check.

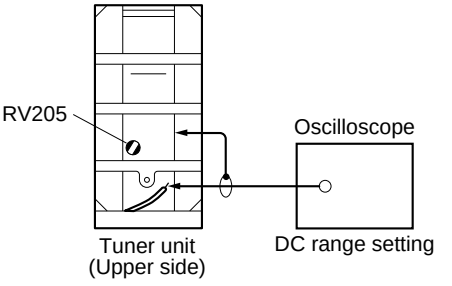
When checking the S/N at 15 dBμVEMF (= −98 dBm) , note the ANNTENA A or B IN connector which shows the better S/N.

Step 2: Adjustment

(1) Connect the signal generator to the ANTENNA A (or B) IN connector which showed the better S/N at the input of 15 dBμVEMF (= −98 dBm) under "Step 1. S/N check".
Set the signal generator as follows;

(2) Connect the oscilloscope to the wire (TP201 terminal) as shown below.

(3) Signal generator setting
FREQUENCY (Carrier frequency): 799.250 MHz
RF OUTPUT (Output level): 15 dBμVEMF (= −98 dBm)
MODULATION (Moduation frequency): 1 kHz
DEVIATION (Frequency deviation): ±5 kHz



(4) Adjust the RF OUTPUT (Output level) of the signal generator so that Signal to Noise ratio is 20 dB ±5 dB (S/N; 20 dB ±5 dB) under the " Step 1. S/N check ".

(5) Turn ⊘RV205(tuner unit) slowly counterclockwise to be the DC voltage of the TP201 (NOISE) terminal (land) change "L" (about 0 V).

(6) Adjustment
Specification: DC voltage of the TP201 (NOISE) terminal(land) change from "L"(about 0 V) to "H"(about 4.8 V) level.
Adjustment: ⊘RV205/RF board (tuner unit)
Turn ⊘RV205 slowly clockwise for adjustment.

Step 3.

After completing adjustment, turn off the WRR-800A power switch and perform the followings.

(1) Remove the tuner unit from the WRR-800A.
(2) Remove the lower side case lid from the tuner unit, and unsolder the wire (80 mm long) from the TP201 (NOISE) terminal (land).
(3) Attach the upper and lower side case lids to the tuner unit, and insert the tuner unit to the slot of the WRR-800A.

3-2-2. Overall Characteristics Check

Perform the overall characteristics check according to the following procedure.

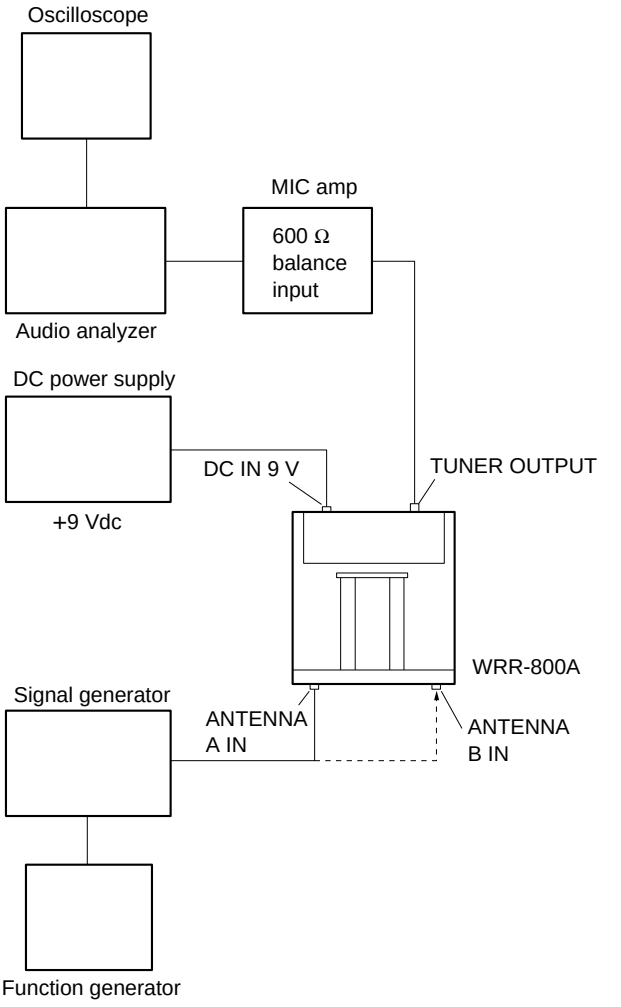
Procedure

1. Output level check
   ↓
2. S/N check
   ↓
3. Frequency characteristic check
   ↓
4. Distortion check
   ↓
5. RF Level indicator /RF indicator check
   ↓
6. AF Level indicator/AF indicator check
   ↓
7. Muting level check
   ↓
8. BATT indicator check
   ↓
9. Tone squelch check

Equipment and Tools

- DC power supply: +9 Vdc
- Signal generator
- Function generator
- Audio analyzer
- Mic amp (Noise mete) with A-weighted filter
- Oscilloscope
- DC current meter

Connection



1. Output level check

Procedure

(1) Set the WRR-800A as follows;
Channel setting: Group 00, 6701 channel (799.250 MHz)
VOL. control: MAX
Muting: OFF
(2) Connect the audio analyzer to the TUNER OUTPUT connector via MIC amp.
(3) Connect the signal generator to the ANTENNA A IN connector.
(4) Set the signal generator as follows:
Signal generator setting
FREQUENCY (Carrier frequency): 799.250 MHz
RF OUTPUT (Output level): 60 dBμVEMF (= −53 dBm)
MODULATION (Modulation frequency): 1 kHz
DEVIATION (Frequency deviation): ±5 kHz
(5) Check that the TUNER OUTPUT connector output level is −20 dBm ±2 dB (at 600 Ω loaded).
(6) Connect the signal generator to the ANTENNA B IN connector.
(7) Check that the TUNER OUTPUT connector output level is −20 dBm ±2 dB (at 600 Ω loaded).

2. S/N Check

Procedure

(1) Set the WRR-800A as follows;
Channel setting: Group 00, 6701 channel (799.250 MHz)
VOL. control: MAX
Muting: OFF
(2) Connect the audio analyzer to the TUNER OUTPUT connector via MIC amp.
(3) Connect the signal generator to the ANTENNA A IN connector.
(4) Set the signal generator as follows:
Signal generator setting
FREQUENCY (Carrier frequency): 799.250 MHz
RF OUTPUT (Output level): 60 dBμVEMF (= −53 dBm)
MODULATION (Modulation frequency): 1 kHz
DEVIATION (Frequency deviation): ±5 kHz
(5) Read the output level of the TUNER OUTPUT connector (Audio analyzer indication level). This level is specified to be 0 dB.
(6) Turn OFF the MODULATION of the signal generator (No modulation).
(7) Check that output level of the TUNER OUTPUT is −62 dB or less (S/N is 62 dB or more with A-weighted filter) as compared with the level of procedure (5) above.
(8) Change the RF OUTPUT (output level) of the signal generator as shown below.
RF OUTPUT (output level): 20 dBμVEMF (= −93 dBm)
(9) Check that output level of the TUNER OUTPUT is −40 dB or less (S/N is 40 dB or more with A-weighted filter) as compared with the level of procedure (5) above.
(10) Change the RF OUTPUT (output level) of the signal generator as shown below.
RF OUTPUT (output level): 60 dBμVEMF (= −53 dBm)
(11) Set the audio analyzer to the distortion mode.
(12) Check that distortion ratio is −43 dB or less (0.7 % or less) with A-weighted.
(13) Connect the signal generator to the ANTENNA B IN connector.
(14) Perform the procedures (4) through (12) above.
(15) Set the channel and FREQUENCY (carrier frequency) of the signal generator as shown ① and ② below. Perform the procedures (1) to (14) above, for each channel setting (① and ②).
① Channel setting: Group 00, 6601 channel (792.250 MHz)
Signal generator setting:
FREQUENCY (carrier frequency); 792.250 MHz
② Channel setting: Group 00, 6751 channel (805.500 MHz)
Signal generator setting:
FREQUENCY (carrier frequency); 805.500 MHz

3. Frequency characteristic check

Procedure

(1) Set the WRR-800A as follows;
Channel setting: Group 00, 6701 channel (799.250 MHz)
VOL. control: MAX
Muting: OFF

(2) Connect the audio analyzer to the TUNER OUTPUT connector via MIC amp.

(3) Connect the signal generator to the ANTENNA A IN connector.

(4) Set the signal generator as follows:
Signal generator setting
FREQUENCY (Carrier frequency): 799.250 MHz
RF OUTPUT (Output level): 60 dBμVEMF (= −53 dBm)
MODULATION (Modulation frequency): 1 kHz
DEVIATION (Frequency deviation): ±12 kHz

(5) Read the output level of the TUNER OUTPUT connector (indication of the audio analyzer). This level is specified to be 0 dB.

(6) Change the MODULATION (modulation frequency) of the signal generator as follows, and check the output level with respect to the output level under the procedure (5) is set also as follows.

Note

100 Hz, 10 kHz and 15 kHz modulation frequency must be set by using the function generator.

MODULATION frequency of signal generator	TUNER OUTPUT connector output level
100 Hz	0 ±2.0 dB
10 kHz	−20 ±2.0 dB
15 kHz	−28 ±2.5 dB

(7) Connect the signal generator to the ANTENNA B IN connector, and perform the procedures (4), (5) and (6).

4. Distortion ratio check

Procedure

(1) Set the WRR-800A as follows;
Channel setting: Group 00, 6701 channel (799.250 MHz)
VOL. control: MAX
Muting: OFF

(2) Connect the audio analyzer to the TUNER OUTPUT connector via MIC amp.

(3) Connect the signal generator to the ANTENNA A IN connector.

(4) Set the signal generator as follows:
Signal generator setting
FREQUENCY (Carrier frequency): 799.250 MHz
RF OUTPUT (Output level): 60 dBμVEMF (= −53 dBm)
MODULATION (Modulation frequency): 1 kHz
DEVIATION (Frequency deviation): ±40 kHz

(5) Set the audio analyzer to the distortion mode, and check that the distortion ratio is less than 0.8 %.

(6) Change the MODULATION (modulation frequency) of the signal generator as shown below.
MODULATION (modulation frequency): 10 kHz
(Note: 10 kHz modulation frequency must be set by using the function generator.)
Check that the distortion ratio is less than 3 %.

(7) Connect the signal generator to the ANTENNA B IN connector, and perform the procedures (4) through (6) above.

(8) Set the channel setting and FREQUENCY (carrier frequency) of the signal generator as shown ① and ② below.
Perform the procedures (1) to (7) above, for each channel setting (① and ②).

① Channel setting: Group 00, 6601 channel (792.250 MHz)
Signal generator setting:
FREQUENCY (carrier frequency); 792.250 MHz

② Channel setting: Group 00, 6751 channel (805.500 MHz)
Signal generator setting:
FREQUENCY (carrier frequency); 805.500 MHz

5. RF level indicator/RF indicator check

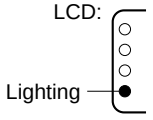
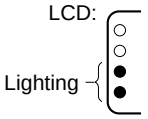
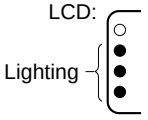
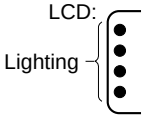
Procedure

(1) Set the WRR-800A as follows;
Channel setting: Group 00, 6701 channel (799.250 MHz)
Muting: OFF

(2) Connect the signal generator to the ANTENNA A IN connector.

(3) Set the signal generator as follows:
Signal generator setting
FREQUENCY (Carrier frequency): 799.250 MHz
RF OUTPUT (Output level): 0 dBμVEMF (= −113 dBm)
MODULATION (Modulation frequency): 1 kHz
DEVIATION (Frequency deviation): ±5 kHz

(4) Increase gradually the output level from the signal generator, and check that the output level of the signal generator is as follows when the RF input level indicator lights.

RF level indicator (green) lights in	Signal generator output level
	25 dBμVEMF ±5 dB
	35 dBμVEMF ±5 dB
	45 dBμVEMF ±5 dB
	55 dBμVEMF ±5 dB

(5) Connect the signal generator to the ANTENNA B IN connector, and perform the procedure (4) above.

(6) Set the channel setting and FREQUENCY (carrier frequency) of the signal generator as shown ① and ② below.
Perform the procedures (2) through (5) above, for each channel setting (① and ②).

① Channel setting: Group 00, 6601 channel (792.250 MHz)
Signal generator setting:
FREQUENCY (carrier frequency); 792.250 MHz

② Channel setting: Group 00, 6751 channel (805.500 MHz)
Signal generator setting:
FREQUENCY (carrier frequency); 805.500 MHz

6. AF level indicator/AF indicator check

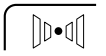
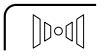
Procedure

(1) Set the WRR-800A as follows;
Channel setting: Group 00, 6701 channel (799.250 MHz)
VOL. control: MAX
Muting: OFF

(2) Connect the signal generator to the ANTENNA A IN connector.

(3) Set the signal generator as follows:
Signal generator setting
FREQUENCY (Carrier frequency): 799.250 MHz
RF OUTPUT (Output level): 60 dBμVEMF (= −53 dBm)
MODULATION (Modulation frequency): 1 kHz

(4) Increase gradually DEVIATION (frequency deviation) of the signal generator starting from ±3 kHz, and check that the deviation of the signal generator is ±(5.0 ±1.2) kHz with the AF indicator as follows.

DEVIATION setting on signal generator	AF indicator
±(5.0 ±1.2) kHz	AF level indicator (LCD): Blinking LCD:  AF indicator (LED): Lights in AF
Less than ±(5.0 ±1.2) kHz	AF level indicator (LCD): Goes out LCD:  AF indicator (LED): Goes out AF

(5) Connect the signal generator to the ANTENNA B IN connector, and perform the procedures (3) and (4) above.

7. Muting level check

Procedure

(1) Set the WRR-800A as follows;
Channel setting: Group 00, 6701 channel (799.250 MHz)
VOL. control: MAX
Muting: ON (Normal mode)

(2) Connect the signal generator to the ANTENNA A IN connector.

(3) Set the signal generator as follows:
Signal generator setting
FREQUENCY (Carrier frequency): 799.250 MHz
RF OUTPUT (Output level): 60 dBμVEMF (= −53 dBm)
MODULATION (Modulation frequency): 1 kHz
DEVIATION (Frequency deviation): ±5 kHz

(4) Check that RF Indicator LED lights (green) and "NO TONE" message appears on LCD.

(5) Change the RF OUTPUT (output level) of the signal generator as shown below.
RF OUTPUT (output level): 20 dBμVEMF (= −93 dBm)

(6) Check that RF Indicator LED goes off (green) and "NO TONE" message disappears on LCD.

(7) Increase gradually the RF OUTPUT (output level) of the signal generator.
Check that RF OUTPUT (output level) is 25 dBμVEMF ±5 dB at when RF Indicator lights (green LED) and "NO TONE" message appears on LCD.

(8) Connect the signal generator to the ANTENNA B IN connector, and perform the procedures (3) through (7) above.

(9) Set the channel setting and FREQUENCY (carrier frequency) of the signal generator as shown ① and ② below.
Perform the procedures (1) to (8) above, for each channel setting (① and ②).

① Channel setting: Group 00, 6601 channel (792.250 MHz)
Signal generator setting:
FREQUENCY (carrier frequency); 792.250 MHz

② Channel setting: Group 00, 6751 channel (805.500 MHz)
Signal generator setting:
FREQUENCY (carrier frequency); 805.500 MHz

8. BATT (Battery) indicator check

Procedure

(1) Set the WRR-800A as follows;
Channel setting: Group 00, 6701 channel (799.250 MHz)
VOL. control: MAX
Muting: ON (Normal mode)

(2) Connect the signal generator to the ANTENNA A IN connector.

(3) Set the signal generator as follows:
Signal generator setting
FREQUENCY (Carrier frequency): 799.250 MHz
RF OUTPUT (Output level): 60 dBμVEMF (= −53 dBm)
MODULATION (Modulation frequency): 32.782 kHz (32.782 kHz must be set by connecting Function generator)
DEVIATION (Frequency deviation): ±2.1 kHz

(4) Turn on and off the MODULATION (modulation frequency) of the signal generator as follows, and check that BATT Indicator change also as follows:

MODULATION setting of signal generator	BATT indicator	
ON	BATT indicator (LCD): Turn the signal generator on and BATT indicator starts blinking after 3 seconds.	LCD:
	BATT indicator (LED): Turn the signal generator on and BATT indicator starts blinking after 3 seconds.	BATT
OFF	BATT indicator (LCD): Blinking is stop.	LCD:
	BATT indicator (LED): Goes out.	BATT

(5) Connect the signal generator to the ANTENNA B IN connector, and perform the procedures (3) and (4) above.

9. Tone squelch check

Procedure

(1) Set the WRR-800A as follows;
Channel setting: Group 00, 6701 channel (799.250 MHz)
VOL. control: MAX
Muting: ON (Normal mode)

(2) Connect the signal generator to the ANTENNA A IN connector.

(3) Set the signal generator as follows:
Signal generator setting
FREQUENCY (Carrier frequency): 799.250 MHz
RF OUTPUT (Output level): 60 dBμVEMF (= −53 dBm)
MODULATION (Modulation frequency): 32.768 kHz (32.768 kHz must be set by connecting Function generator)
DEVIATION (Frequency deviation): ±1.4 kHz

(4) Turn on and off the MODULATION (modulation frequency) of the signal generator as follows, and the LCD indication changes also as follows.

MODULATION ON/OFF on signal generator	LCD indication
ON	GP/CH indication (LCD): "00. 6701" appears.
OFF	GP/CH indication (LCD): "NO TONE" appears.

(5) Connect the signal generator to the ANTENNA B IN connector, and perform the procedures (3) and (4) above.

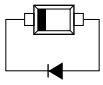
SECTION 4
SEMICONDUCTOR PIN ASSIGNMENTS

Semiconductors of which functions are equivalent are described here. For parts replacement, refer to the section of Spare Parts in this manual. The circuit diagram of each IC is obtained from the IC data book published by the manufacturer.

ここに記載されている半導体は，それぞれの機能を等価的に表したものです。 なお，互換性のない型名を併記していることがありますので，部品を交換するときは，Spare Partsの章を参照してください。
等価回路はICメーカーのデータブックに従いました。

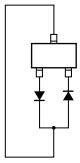
DIODE

—TOP VIEW—



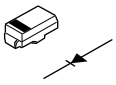
1SS355
1SS355TE-17

—TOP VIEW—



1SS362-TE85L

—TOP VIEW—



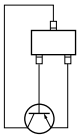
EC10QS-04
EC10QS04-TE12L5

—TOP VIEW—

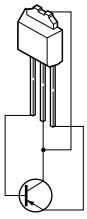
RB411D
RB411D-T146
SB07-03C
SB07-03C-TB

TRANSISTOR

—TOP VIEW—

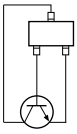


2SA1832-YGR-TE85L1

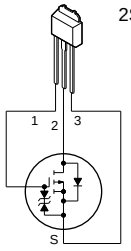


2SB1202FAST
2SB1202FAT-TL

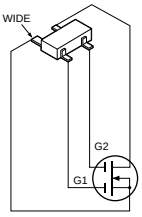
—TOP VIEW—



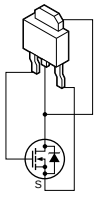
2SC4738-YGR-TE85L
2SD2216-Q (TOSHIBA)



2SJ377(TE16L)

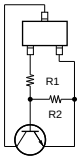


3SK239AXRTL



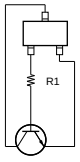
MTD20N06HDL-T4

—TOP VIEW—



UN9213
RN1104-TE85L

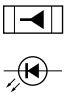
—TOP VIEW—



DTC323TK
(R1=2.2 K)
DTC323TKT146
(R1=2.2 K)

LED

—TOP VIEW—

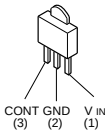


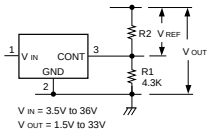
SML-310DTT86
SML-310LTT86
SML-310MTT86

IC

M5237ML-TP1 (MITSUBISHI)

ADJUSTABLE VOLTAGE REGULATOR





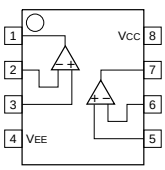
V IN = 3.5V to 36V
V OUT = 1.5V to 33V

V OUT =VREF (1+ R2/R1) ≒ 1.26x (1+ R2/4.3) (V)
(R1 = 4.3KΩ, VREF ≒ 1.26V)

NJM2904V(TE2) (JRC)FLAT PACKAGE(SMALL)

DUAL OPERATIONAL AMPLIFIERS
(SINGLE-SUPPLY TYPE)

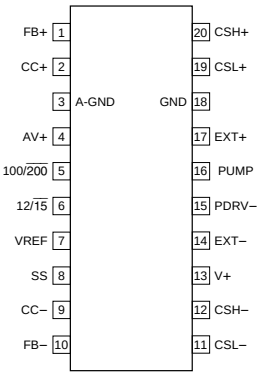
—TOP VIEW—



TYPE	VCC - VEE
828 TYPE	+5 to +36V
2244 TYPE	+2.5 to +36V
2904 TYPE	+3 to +24V
3404 TYPE	+4 to +32V
3414 TYPE	+3 to +10V
4572 TYPE	+4 to +14V
5216 TYPE	+4 to +32V
7022 TYPE	+3 to +16V
7062 TYPE	+3 to +16V
75W01 TYPE	+3 to +10V
33172 TYPE	+3 to +44V
OTHERS	+3 to +36V

MAX742CWP-TE2 (MAXIM)

DUAL-OUTPUT, SWITCH-MODE REGURATOR
—TOP VIEW—

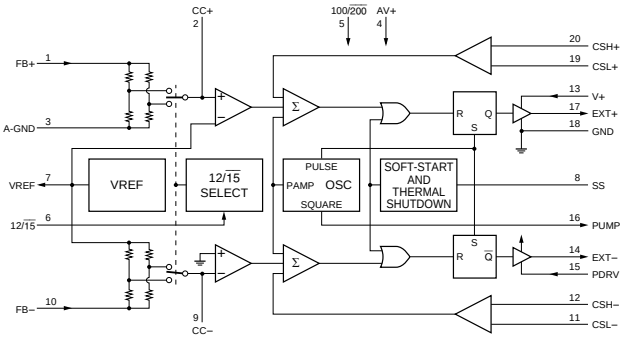


INPUT

12/15	:	SELECTS VOUTS (±15 V/±12 V)
100/200	:	SELECTS OSC FREQUENCY (200 kHz/100 kHz)
AV+	:	ANALOG SUPPLY VOLTAGE INPUT (+5 V)
CC–	:	INVERTING COMPENSATION CAPACITOR
CC+	:	STEP-UP COMPENSATION CAPACITOR
CSH–	:	CURRENT SENSE HIGH (INVERTING SECTION)
CSH+	:	CURRENT SENSE HIGH (STEP-UP SECTION)
CSL–	:	CURRENT SENSE LOW (INVERTING SECTION)
CSL+	:	CURRENT SENSE LOW (STEP-UP SECTION)
FB–	:	INVERTING SECTION FEEDBACK INPUT
FB+	:	STEP-UP FEEDBACK INPUT
PDRV	:	VOLTAGE INPUT
SS	:	SOFT-START TIMING CAPACITOR
V+	:	HIGH-CURRENT SUPPLY VOLTAGE INPUT (+5 V)

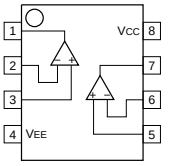
OUTPUT

EXT–	:	PUSH-PULL OUTPUT
EXT+	:	PUSH-PULL OUTPUT
VREF	:	REFERENCE VOLTAGE OUTPUT



NJM4558V-TE2 (JRC)FLAT PACKAGE(SMALL)
NJM4560M (JRC)FLAT PACKAGE
NJM4560M-TE2
NJM5532M (JRC)FLAT PACKAGE
NJM5532M(TE2)

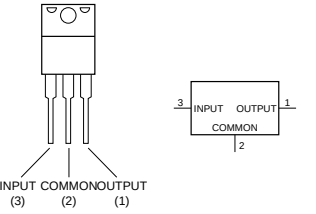
DUAL OPERATIONAL AMPLIFIERS
(DUAL-SUPPLY TYPE)
—TOP VIEW—



TYPE	VCC	VEE
062/072/082/4556A/ M5218/BA15218/ 33178/34182 TYPES	+2 to +16V	−2 to −16V
4580 TYPE	+2 to +18V	−2 to −18V
5532 TYPE	+3 to +20V	−3 to −20V
CXA1297 TYPE	+5 to +12V	−5 to −12V
M5219/M5220 TYPES	+5 to +22.5V	−5 to −22.5V
MC33077DR2	+2.5 to +18V	−2.5 to −18V
NJM2100 TYPE	+1 to +3.5V	−1 to −3.5V
OP-297 TYPE	+2 to +20V	−2 to −20V
OTHERS	+5 to +16V	−5 to −16V

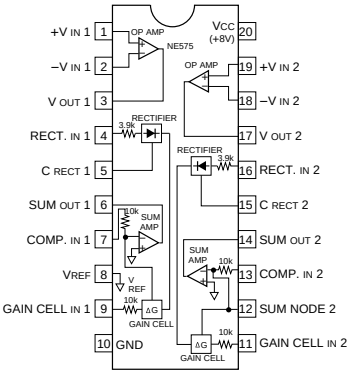
NJM78M09FA (JRC)+9 V(0.5 A)

POSITIVE VOLTAGE REGULATOR
—FRONT VIEW—



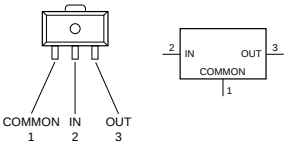
NE575DK (SIGNETICS)FLAT PACKAGE
NE575DK-T

LOW VOLTAGE COMPANDOR
—TOP VIEW—



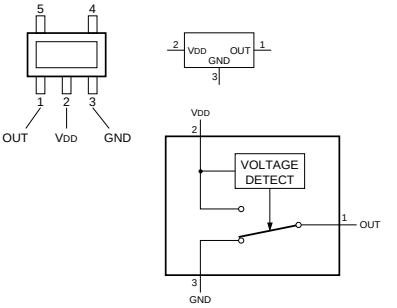
NJM79L12UA (JRC)+12 V(0.1 A)
NJM79L12UA(TE1)

VOLTAGE REGULATOR



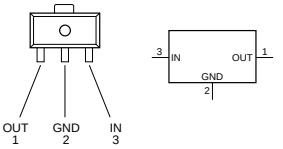
S-80735SN-DZ-T1

C-MOS VOLTAGE DETECTOR
—TOP VIEW—



NJM78L12UA-TE1 (JRC)+12 V(0.1 A)

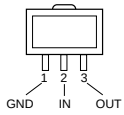
POSITIVE VOLTAGE REGULATOR
—SIDE VIEW—

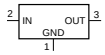


S-81250PG-PD-S
S-81250PG-PD-T1

THREE TERMINAL POSITIVE VOLTAGE REGULATOR

—TOP VIEW—



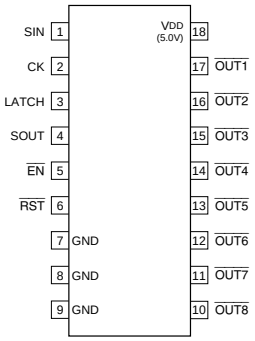


TA8122AF (TSB)FLAT PACKAGE
TA8122AF(J.TP2)

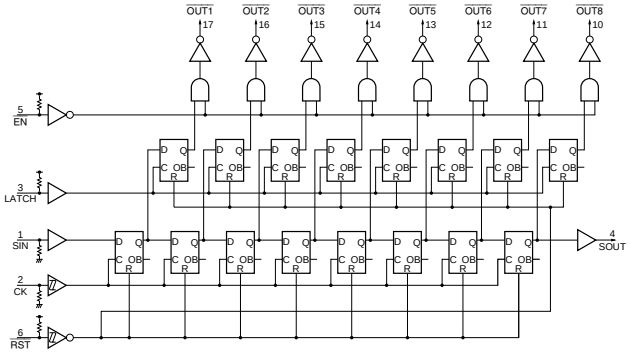
BU2114F(ROHM)FLAT PACKAGE

CMOS SHIFT RESISTOR WITH LATCH

—TOP VIEW—



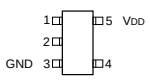
SIN	:	SERIAL DATA INPUT
CK	:	SHIFT CLOCK INPUT
LATCH	:	LATCH INPUT
SOUT	:	SHIFT RESISTOR (FINAL STAGE) OUTPUT
$\overline{EN}$	:	ENABLE INPUT
RST	:	RESET INPUT
$\overline{OUT1}$ - $\overline{OUT8}$	:	SHIFT RESISTOR LATCH OUTPUT1-8

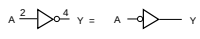


TC4S69F (TOSHIBA)CHIP PACKAGE
TC4S69F(TE85R)

C-MOS INVERTER

—TOP VIEW—





Y = $\overline{A}$

A	Y
0	1
1	0

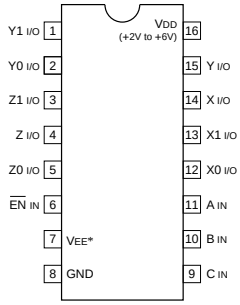
0 ; LOW LEVEL
1 ; HIGH LEVEL

TYPE	VDD
7S04F 7SU04F 7SU04FU	+2 to +6V
4S69F 4SU69F	+3 to +18V
7SH04FU 7SHU04FU	+2 to +5.5V

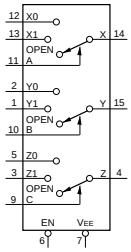
TC74HC4053AFS (TOSHIBA)FLAT PACKAGE
TC74HC4053AFS-EL

C-MOS TRIPLE 2-CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER

—TOP VIEW—



VEE*; VDD – VEE = +3V to +12V
VEE ≦ GND



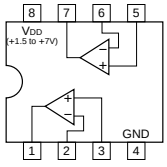
CONTROL INPUTS				ON CHANNEL		
EN	SELECT					
	C	B	A			
0	0	0	0	Z0	Y0	X0
0	0	0	1	Z0	Y0	X1
0	0	1	0	Z0	Y1	X0
0	0	1	1	Z0	Y1	X1
0	1	0	0	Z1	Y0	X0
0	1	0	1	Z1	Y0	X1
0	1	1	0	Z1	Y1	X0
0	1	1	1	Z1	Y1	X1
1	X	X	X	OPEN		

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

TC75W51FU-TE12R (TOSHIBA)

C-MOS DUAL OPERATIONAL AMPLIFIER

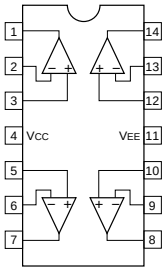
—TOP VIEW—



UPC4574G2 (NEC)
UPC4574G2-T1

QUAD OPERATIONAL AMPLIFIER

—TOP VIEW—



VCC – VEE ≦ 36V

SECTION 5
BLOCK DIAGRAM

Outline

The WRR-800A consists of the following boards and tuner unit:

Board name	Ref. No.
MB-786 board	1000 to 1200 series
CN-1598 board	110, 1100, 1300, 1700, 2000 to 2400 series
VR-245 board	1200 series
RE-157 board	1000, 1200 series

Tuner Unit

The tuner unit consists of the RF board and the DP board.
Tuner unit works as a PLL synthesizer diversity tuner, and its power voltage (DC +9V) is supplied from the CN-1598 board through the MB-786 board.
The RF (radio frequency) signals are input from both antenna A and antenna B, and the audio signal is output to the MB-786 board through the CN-1598 board. The RF board is composed of RF block, audio block, CPU block and voltage regulator.
The DP board is composed of display block and the operation block.

Power Supply Block

The DC +9 V from the AC power adapter is input to the MB-786 board, it is converted up to ±15 V with DC-DC converter (IC1001), then output as ±12 V from the voltage regulator (IC1004/IC1005). Generated ±12 V are used for the power of audio output amplifier (IC1101) on the MB-786 board. Also, to generate +9 V, converted +15 V is input to the voltage regulator (IC1006), then obtained +9 V is supplied to the tuner unit.

Audio Block

The audio signal (AF) output from the tuner unit is input to the MB-786 board through the CN-1598 board. Signals is then output from the output connector (J1101) after passing through the filter amplifier (IC1101), output amplifier (IC1101) and audio muting circuit.

MB-786 Board

The power supply block and audio signal output block are mounted on this board. This board consists of the DC-DC converter circuits (DC+9 V to ±15 V), voltage regulator circuits (±15 V to ±12 V), audio output circuit and audio signal muting circuit.

CN-1586 Board

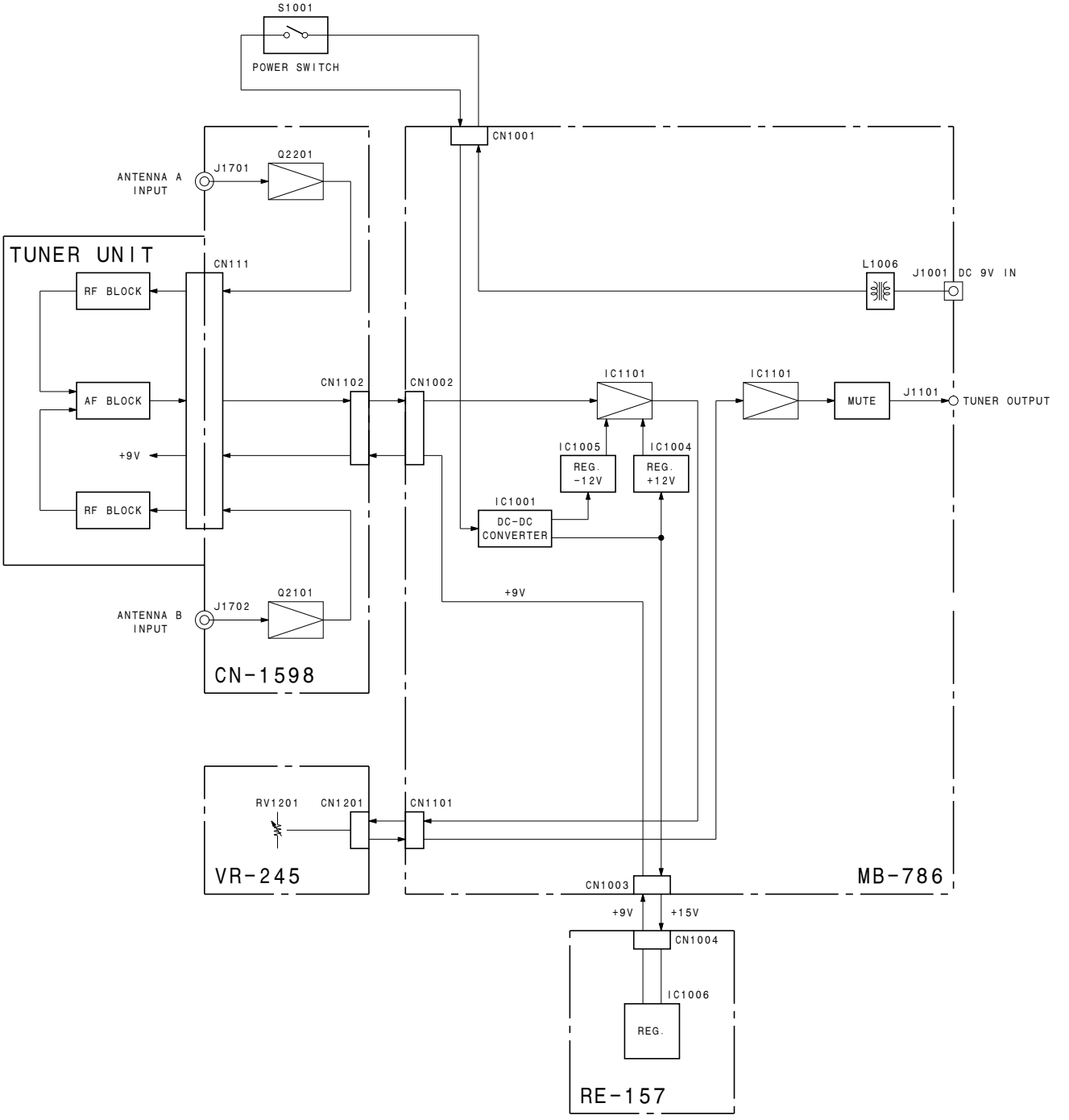
This board functions as a relay board for signal buffering between the tuner unit and MB-786 board.

VR-245 Board

This board is functioned as an audio output adjustment.

RE-157 Board

This board is functioned as voltage regulator for the tuner unit.



OVERALL BLOCK

WRR-800/WRR-800A

SECTION 6
SPARE PARTS

6-1. NOTES ON REPAIR PARTS

(1) Safety Related Components Warning

Components marked ⚠ are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

(2) Standardization of Parts

Repair parts supplied from Sony Parts Center may not be always identical with the parts which actually in use due to “accommodating the improved parts and/or engineering changes” or “standardization of genuine parts”.

This manual's exploded views and electrical spare parts list are indicating the part numbers of “the standardized genuine parts at present” .

(3) Stock of Parts

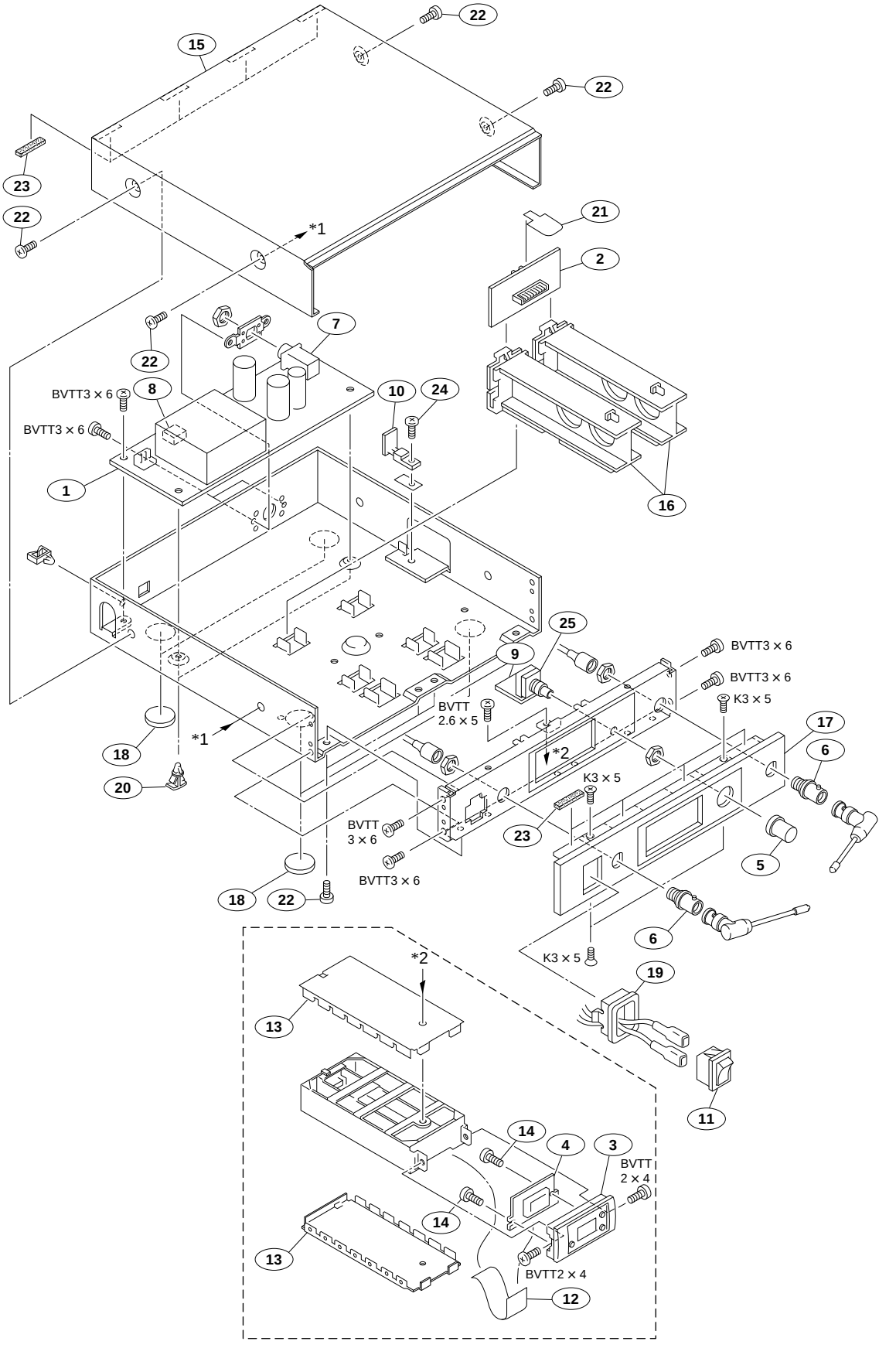
Parts marked with “o” SP (Supply Code) column of the spare parts list are not normally required for routine service work. Orders for parts marked with “o” will be processed, but allow for additional delivery time.

(4) Units for Capacitors, Inductors and Resistors

The following units are assumed in schematic diagrams, electrical parts list and exploded views unless otherwise specified.

Capacitors : μF
Inductors : μH
Resistors : Ω

6-2. EXPLODED VIEW AND PARTS LIST



Tuner unit (Conpatible with WRU-801/801A)

No.	Part No.	SP	Description
1	A-8317-197-A	o	MOUNTED CIRCUIT BOARD, MB-786
2	A-8317-199-A	o	MOUNTED CIRCUIT BOARD, CN-1597
3	A-8317-231-A	s	CASE ASSY, F
4	A-8317-232-A	s	LCD ASSY
5	X-3668-075-0	s	KNOB ASSY, CONTROL
6	1-562-576-11	s	ADAPTER, CONVERSION BNC PIN
7	1-568-519-31	s	JACK, LARGE TYPE
8	1-569-966-11	s	JACK, DC
9	1-666-754-12	o	PRINTED CIRCUIT BOARD, VR-245
10	1-666-755-12	o	PRINTED CIRCUIT BOARD, RE-157
11	1-771-182-11	s	SWITCH, POWER
12	1-783-026-11	s	WIRE, FLAT TYPE (33 CORE)
13	2-545-180-01	o	LID
14	2-545-186-01	o	+BTP 2X5 (W2)
15	2-545-188-01	o	COVER
16	2-545-189-02	o	RAIL
17	2-545-190-02	o	PANEL, FRONT
18	2-545-194-01	o	FOOT
19	2-545-196-01	o	BARRIER (SW)
20	2-545-206-01	o	SPACER (PB)
21	2-545-363-01	s	PLATE, CONNECTION
22	2-545-387-11	s	BTT M3(TITE)
23	3-897-034-01	o	CUSHION (SMALL), ESCUTCHEON
24	4-382-854-01	s	SCREW (M3X8), P, SW (+)
25	1-237-790-11	s	RES, VAR, CARBON 10K

6-3. ELECTRICAL PARTS LIST

CN-1597 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8317-199-A	o	MOUNTED CIRCUIT BOARD, CN-1597
C2101	1-162-927-11	s	CERAMIC, CHIP 100PF 5% 50V
C2102	1-162-911-11	s	CERAMIC, CHIP 6PF 50V
C2103	1-162-910-11	s	CERAMIC, CHIP 5PF 50V
C2104	1-135-179-21	s	TANTALUM 2.2uF 10% 16V
C2105	1-162-974-11	s	CERAMIC, CHIP 0.01uF 50V
C2106	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C2107	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C2108	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C2109	1-115-416-11	s	CERAMIC 1000PF 5% 25V
C2110	1-162-910-11	s	CERAMIC, CHIP 5PF 50V
C2111	1-162-910-11	s	CERAMIC, CHIP 5PF 50V
C2112	1-162-927-11	s	CERAMIC, CHIP 100PF 5% 50V
C2114	1-162-927-11	s	CERAMIC, CHIP 100PF 5% 50V
C2201	1-162-927-11	s	CERAMIC, CHIP 100PF 5% 50V
C2202	1-162-911-11	s	CERAMIC, CHIP 6PF 50V
C2203	1-162-911-11	s	CERAMIC, CHIP 6PF 50V
C2204	1-135-179-21	s	TANTALUM 2.2uF 10% 16V
C2205	1-162-974-11	s	CERAMIC, CHIP 0.01uF 50V
C2206	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C2207	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C2208	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C2209	1-115-416-11	s	CERAMIC 1000PF 5% 25V
C2210	1-162-910-11	s	CERAMIC, CHIP 5PF 50V
C2211	1-162-912-11	s	CERAMIC, CHIP 7PF 50V
C2212	1-162-927-11	s	CERAMIC, CHIP 100PF 5% 50V
C2214	1-162-927-11	s	CERAMIC, CHIP 100PF 5% 50V
CN111	1-569-668-11	s	CONNECTOR BB, 10P
L2101	1-414-461-41	s	INDUCTOR 6.8nH 10% 4GHz
L2103	1-414-461-41	s	INDUCTOR 6.8nH 10% 4GHz
L2201	1-414-461-41	s	INDUCTOR 6.8nH 10% 4GHz
L2203	1-414-461-41	s	INDUCTOR 6.8nH 10% 4GHz
Q2101	8-729-035-13	s	TRANSISTOR 3SK239AXRTL
Q2201	8-729-035-13	s	TRANSISTOR 3SK239AXRTL
R1301	1-216-081-00	s	METAL, CHIP 22K 5% 1/10W
R2101	1-216-843-11	s	METAL, CHIP 68K 5% 1/16W
R2102	1-216-839-11	s	METAL, CHIP 33K 5% 1/16W
R2103	1-216-839-11	s	METAL, CHIP 33K 5% 1/16W
R2104	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R2105	1-216-812-11	s	METAL, CHIP 180 5% 1/16W
R2106	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R2107	1-216-803-11	s	METAL, CHIP 33 5% 1/16W
R2108	1-216-802-11	s	METAL, CHIP 27 5% 1/16W
R2109	1-216-803-11	s	METAL, CHIP 33 5% 1/16W
R2111	1-216-843-11	s	METAL, CHIP 68K 5% 1/16W
R2112	1-216-839-11	s	METAL, CHIP 33K 5% 1/16W
R2113	1-216-839-11	s	METAL, CHIP 33K 5% 1/16W
R2114	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R2115	1-216-812-11	s	METAL, CHIP 180 5% 1/16W
R2116	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R2117	1-216-803-11	s	METAL, CHIP 33 5% 1/16W
R2118	1-216-802-11	s	METAL, CHIP 27 5% 1/16W
R2119	1-216-803-11	s	METAL, CHIP 33 5% 1/16W
R2301	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R2401	1-216-864-11	s	METAL, CHIP 0 5% 1/16W

MB-786 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8317-197-A	o	MOUNTED CIRCUIT BOARD, MB-786
C1001	1-115-757-11	s	ELECT 330uF 20% 16V
C1002	1-163-809-11	s	CERAMIC, CHIP 0.047uF 10% 25V
C1003	1-124-779-00	s	ELECT 10uF 20% 16V
C1004	1-115-758-11	s	ELECT 470uF 20% 16V
C1005	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C1006	1-162-967-11	s	CERAMIC, CHIP 0.0033uF 10% 50V
C1007	1-135-259-11	s	TANTAL 10uF 20% 6.3V
C1008	1-135-149-21	s	TANTALUM, CHIP 2.2uF 10% 10V
C1009	1-162-967-11	s	CERAMIC, CHIP 0.0033uF 10% 50V
C1010	1-135-091-00	s	TANTALUN, CHIP 1uF 10% 16V
C1011	1-135-091-00	s	TANTALUN, CHIP 1uF 10% 16V
C1012	1-115-758-11	s	ELECT 470uF 20% 16V
C1013	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C1014	1-115-758-11	s	ELECT 470uF 20% 16V
C1015	1-115-758-11	s	ELECT 470uF 20% 16V
C1016	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C1017	1-164-156-11	s	CERAMIC, CHIP 0.1uF 25V
C1018	1-115-757-11	s	ELECT 330uF 20% 16V
C1019	1-115-757-11	s	ELECT 330uF 20% 16V
C1020	1-128-548-11	s	ELECT 4700uF 20% 25V
C1021	1-126-943-11	s	ELECT 2200uF 20% 25V
C1022	1-163-809-11	s	CERAMIC, CHIP 0.047uF 10% 25V
C1023	1-163-809-11	s	CERAMIC, CHIP 0.047uF 10% 25V
C1027	1-164-004-11	s	CERAMIC, CHIP 0.1uF 10% 25V
C1028	1-126-103-11	s	ELECT 470uF 20% 16V
C1029	1-164-004-11	s	CERAMIC, CHIP 0.1uF 10% 25V
C1030	1-126-103-11	s	ELECT 470uF 20% 16V
C1031	1-128-400-11	s	ELECT 47uF 20% 25V
C1032	1-124-779-00	s	ELECT 10uF 20% 16V
C1033	1-164-346-11	s	CERAMIC 1uF 16V
C1034	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C1035	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C1036	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C1037	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C1103	1-164-004-11	s	CERAMIC, CHIP 0.1uF 10% 25V
C1104	1-164-004-11	s	CERAMIC, CHIP 0.1uF 10% 25V
C1105	1-162-967-11	s	CERAMIC, CHIP 0.0033uF 10% 50V
C1106	1-164-004-11	s	CERAMIC, CHIP 0.1uF 10% 25V
C1107	1-164-004-11	s	CERAMIC, CHIP 0.1uF 10% 25V
C1108	1-164-315-11	s	CERAMIC, CHIP 470PF 5% 50V
C1109	1-164-315-11	s	CERAMIC, CHIP 470PF 5% 50V
C1110	1-164-004-11	s	CERAMIC, CHIP 0.1uF 10% 25V
C1111	1-164-004-11	s	CERAMIC, CHIP 0.1uF 10% 25V
C1112	1-126-205-11	s	ELECT 47uF 20% 6.3V
C1113	1-126-205-11	s	ELECT 47uF 20% 6.3V
C1114	1-128-400-11	s	ELECT 47uF 20% 25V
C1115	1-128-400-11	s	ELECT 47uF 20% 25V
C1118	1-164-739-11	s	CERAMIC 560PF 5% 50V
C1119	1-164-739-11	s	CERAMIC 560PF 5% 50V
C1120	1-162-959-11	s	CERAMIC, CHIP 330PF 5% 50V
C1121	1-136-153-00	s	FILM 0.01uF 5% 50V
C1122	1-163-275-11	s	CERAMIC, CHIP 0.001uF 5% 50V
C1123	1-163-275-11	s	CERAMIC, CHIP 0.001uF 5% 50V
C1124	1-163-275-11	s	CERAMIC, CHIP 0.001uF 5% 50V
C1125	1-164-218-11	s	CERAMIC, CHIP 180PF 50V
C1201	1-128-548-11	s	ELECT 4700uF 20% 25V
C1202	1-164-004-11	s	CERAMIC, CHIP 0.1uF 10% 25V

(MB-786 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C1203	1-164-004-11	s	CERAMIC, CHIP 0.1uF 10% 25V
C1204	1-113-981-11	s	TANTAL 22uF 20% 20V
C1205	1-113-981-11	s	TANTAL 22uF 20% 20V
C1206	1-164-346-11	s	CERAMIC 1uF 16V
C1207	1-113-981-11	s	TANTAL 22uF 20% 20V
C1208	1-124-779-00	s	ELECT 10uF 20% 16V
CN1001	1-564-104-00	o	CONNECTOR (B3P-VH) 3P, MALE
CN1002	1-564-706-11	o	CONNECTOR (SMALL TYPE) 4P, MALE
CN1003	1-564-705-11	o	PIN HEADER, STRAIGHT 3P
CN1101	1-564-705-11	o	PIN HEADER, STRAIGHT 3P
D1002	8-719-980-38	s	DIODE SB07-03C
D1003	8-719-980-38	s	DIODE SB07-03C
D1004	8-719-210-39	s	DIODE EC10QS04
D1005	8-719-210-39	s	DIODE EC10QS04
D1006	8-719-210-39	s	DIODE EC10QS04
D1007	8-719-988-62	s	DIODE 1SS355TE
D1008	8-719-988-62	s	DIODE 1SS355TE
D1101	8-719-024-71	s	DIODE 1SS362-TE85L
D1102	8-719-024-71	s	DIODE 1SS362-TE85L
D1202	8-719-975-40	s	DIODE RB411D
D1203	8-719-975-40	s	DIODE RB411D
IC1001	8-759-466-72	s	IC MAX742CWP-TE2
IC1002	8-759-095-59	s	IC M5237ML-TP1
IC1004	8-759-175-30	s	IC NJM78L12UA-TE1
IC1005	8-759-712-00	s	IC NJM79L12UA
IC1101	8-759-141-05	s	IC UPC4574G2
IC1102	8-759-745-64	s	IC NJM4560M
IC1103	8-759-700-94	s	IC NJM5532M
IC1201	8-759-355-28	s	IC S-80735SN-DZ-T1
IC1202	8-759-209-57	s	IC TC4S69F
IC1203	8-759-209-57	s	IC TC4S69F
J1001	1-569-966-11	s	JACK, DC
J1101	1-568-519-31	s	JACK, LARGE TYPE
L1001	1-411-587-21	s	COIL, CHOKE 150uH
L1002	1-411-587-21	s	COIL, CHOKE 150uH
L1003	1-416-357-11	s	COIL, CHOKE
L1004	1-414-119-11	s	INDUCTOR CHIP 22uH
L1005	1-416-358-11	s	COIL, CHOKE
L1006	1-424-618-11	s	FILTER, NOISE
Q1001	8-729-822-84	s	TRANSISTOR 2SB1202FAST
Q1002	8-729-041-36	s	TRANSISTOR MTD20N06HDLT4
Q1003	8-729-041-37	s	TRANSISTOR 2SJ377(TE16L)
Q1004	8-729-037-53	s	TRANSISTOR 2SA1832-YGR-TE85L1
Q1101	8-729-015-39	s	TRANSISTOR DTC323TK
Q1102	8-729-015-39	s	TRANSISTOR DTC323TK
Q1103	8-729-015-39	s	TRANSISTOR DTC323TK
Q1104	8-729-015-39	s	TRANSISTOR DTC323TK
Q1201	8-729-425-64	s	TRANSISTOR 2SD2216-Q
Q1202	8-729-425-64	s	TRANSISTOR 2SD2216-Q
Q1203	8-729-425-64	s	TRANSISTOR 2SD2216-Q
R1001	1-216-033-00	s	METAL, CHIP 220 5% 1/10W
R1002	1-216-809-11	s	METAL, CHIP 100 5% 1/16W
R1004	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R1005	1-220-906-11	s	RES, CHIP 0.15 10% 2W
R1006	1-217-611-00	s	METAL 0.1 10% 2W

(MB-786 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R1007	1-216-813-11	s	METAL, CHIP 220 5% 1/16W
R1008	1-218-724-11	s	METAL 22K 0.50% 1/16W
R1009	1-218-710-11	s	METAL 5.6K 0.50% 1/16W
R1014	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R1015	1-216-834-11	s	METAL, CHIP 12K 5% 1/16W
R1016	1-216-192-00	s	RES, CHIP 560 5% 1/8W
R1017	1-216-805-11	s	METAL, CHIP 47 5% 1/16W
R1018	1-216-805-11	s	METAL, CHIP 47 5% 1/16W
R1101	1-216-829-11	s	METAL, CHIP 4.7K 5% 1/16W
R1102	1-216-809-11	s	METAL, CHIP 100 5% 1/16W
R1103	1-216-824-11	s	METAL, CHIP 1.8K 5% 1/16W
R1104	1-216-835-11	s	METAL, CHIP 15K 5% 1/16W
R1105	1-218-716-11	s	METAL 10K 0.50% 1/16W
R1106	1-218-716-11	s	METAL 10K 0.50% 1/16W
R1107	1-218-718-11	s	METAL 12K 0.50% 1/16W
R1108	1-218-718-11	s	METAL 12K 0.50% 1/16W
R1109	1-218-718-11	s	METAL 12K 0.50% 1/16W
R1110	1-218-718-11	s	METAL 12K 0.50% 1/16W
R1111	1-218-709-11	s	METAL 5.1K 0.50% 1/16W
R1112	1-218-709-11	s	METAL 5.1K 0.50% 1/16W
R1113	1-218-709-11	s	METAL 5.1K 0.50% 1/16W
R1114	1-218-709-11	s	METAL 5.1K 0.50% 1/16W
R1117	1-216-811-11	s	METAL, CHIP 150 5% 1/16W
R1118	1-216-811-11	s	METAL, CHIP 150 5% 1/16W
R1119	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R1120	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R1121	1-216-045-00	s	METAL, CHIP 680 5% 1/10W
R1122	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R1123	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R1202	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R1203	1-216-117-00	s	METAL, CHIP 680K 5% 1/10W
R1204	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R1205	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R1206	1-216-105-91	s	RES, CHIP 220K 5% 1/10W
R1207	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W

RE-157 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-666-755-21	o	PRINTED CIRCUIT BOARD, RE-157
C1209	1-164-004-11	s	CERAMIC, CHIP 0.1uF 10% 25V
C1210	1-164-004-11	s	CERAMIC, CHIP 0.1uF 10% 25V
IC1006	8-759-701-59	s	IC NJM78M09FA

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VR-245 BOARD
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Ref. No.
or Q'ty  Part No.    SP Description

1pc      1-666-754-21 o PRINTED CIRCUIT BOARD, VR-245
RV1201   1-237-790-11 s RES, VAR CARBON 10K
```

```
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FRAME
-----
Ref. No.
or Q'ty  Part No.    SP Description

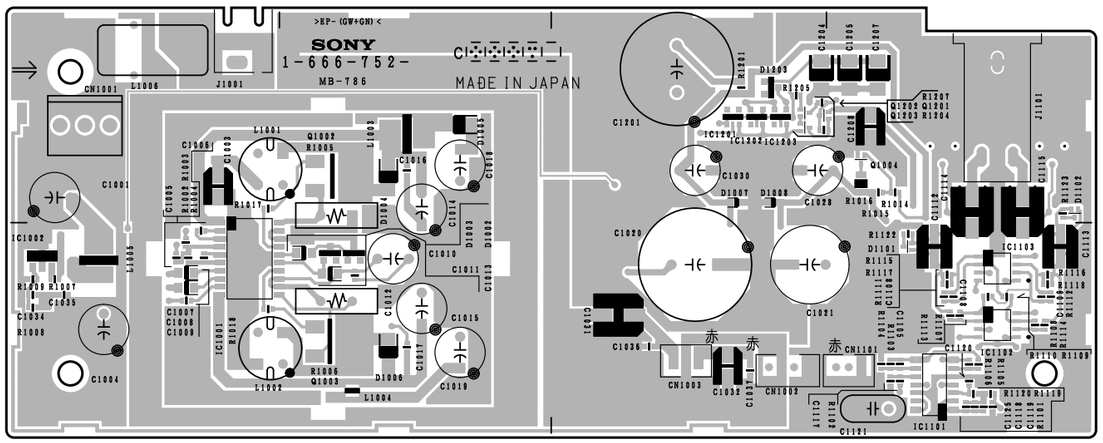
1pc      1-562-576-11 s ADAPTER, CONVERSION BNC PIN
1pc      1-771-182-11 s SWITCH, POWER
1pc      1-783-026-11 s WIRE, FLAT TYPE (33 CORE)
```

6-4. SUPPLIED ACCESSORIES

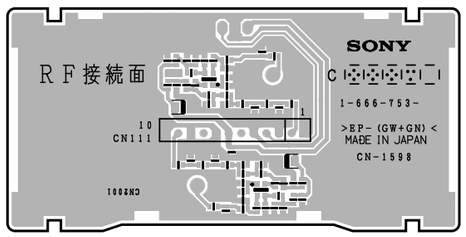
```
Ref. No.
or Q'ty  Part No.    SP Description

1pc    ⚠ 1-467-852-11 s ADAPTOR, AC
2pcs      1-501-952-11 s ANNTENA
1pc       3-860-929-31 s MANUAL, INSTRUCTION
```

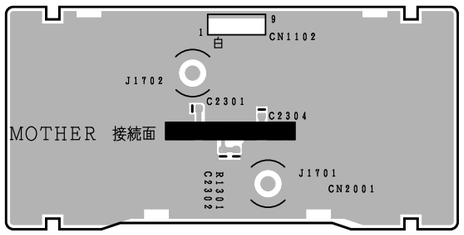
SECTION 7
SCHEMATIC DIAGRAMS AND BOARD LAYOUTS



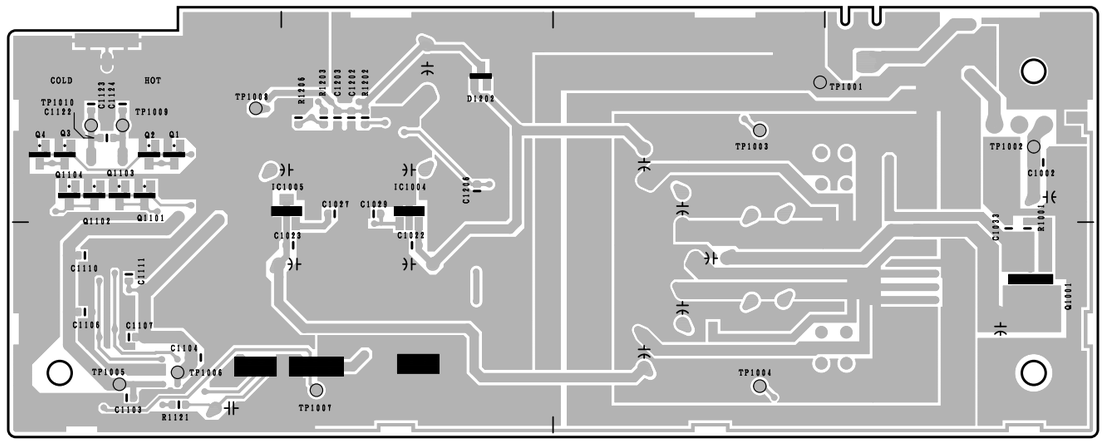
MB-786 -A SIDE
1-666-752-21



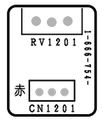
CN-1598 -A SIDE
1-666-753-21



CN-1598 -B SIDE
1-666-753-21

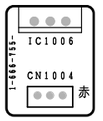


MB-786 -B SIDE
1-666-752-21



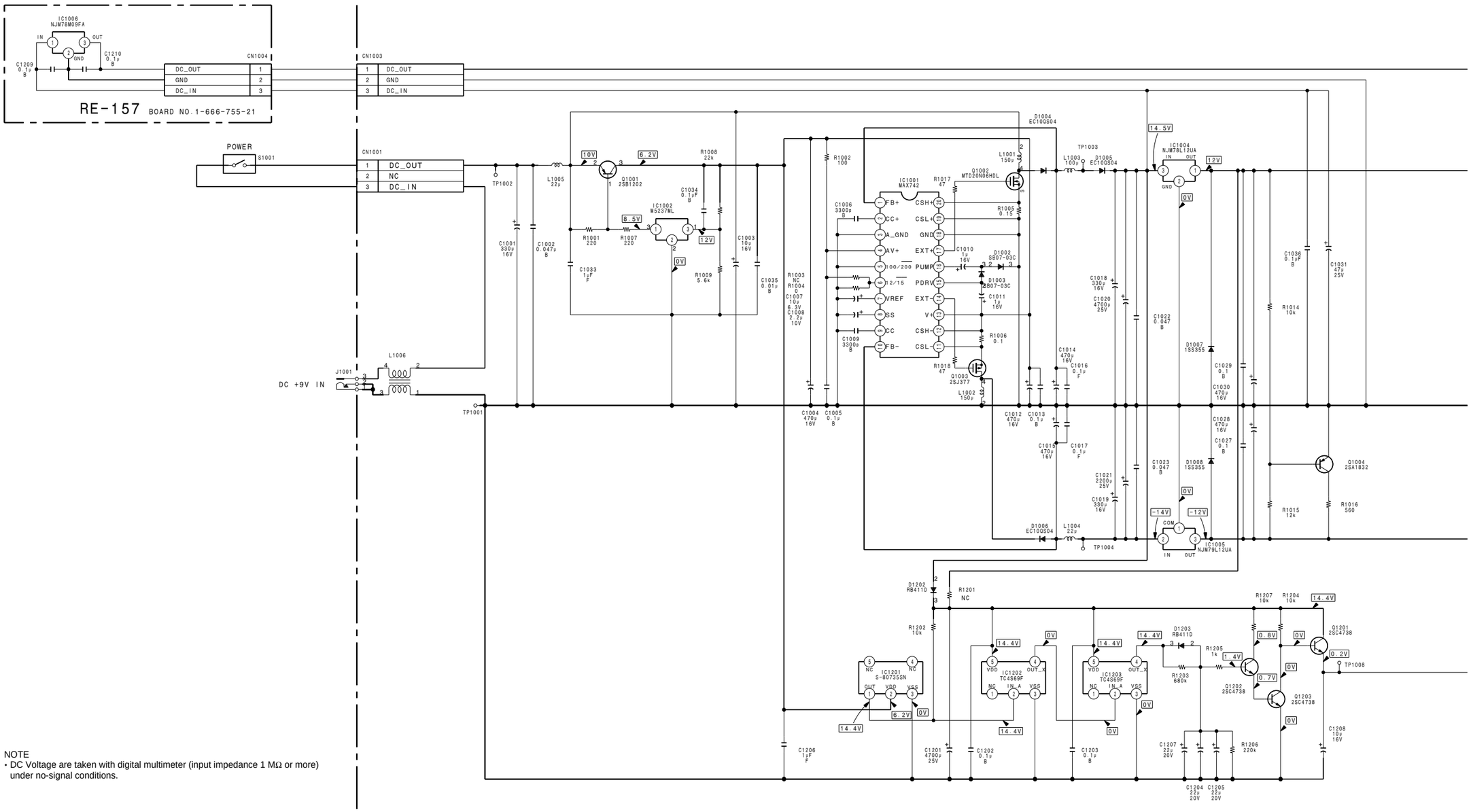
VR-245 -A SIDE
1-666-754-21

VR-245 -B SIDE
1-666-754-21

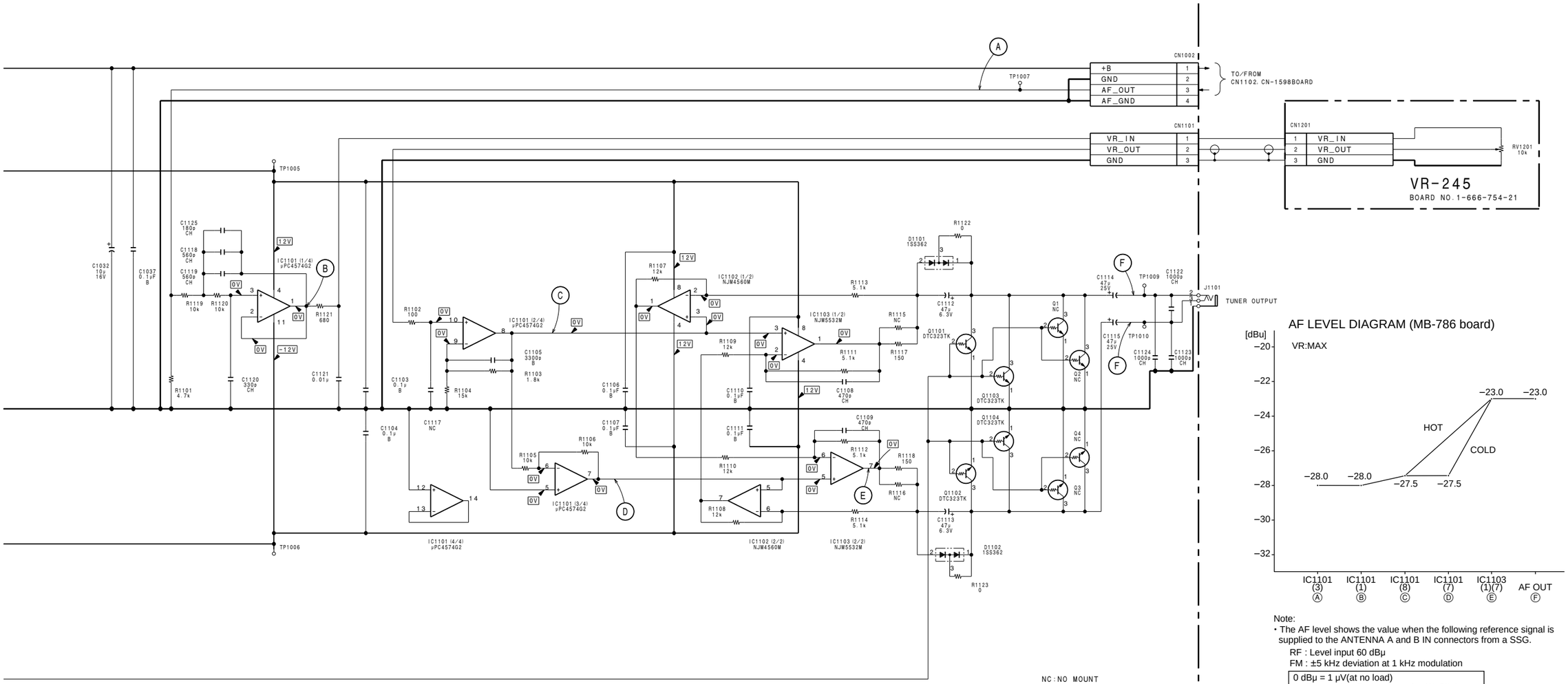


RE-157 -A SIDE
1-666-755-21

RE-157 -B SIDE
1-666-755-21



NOTE
- DC Voltage are taken with digital multimeter (input impedance 1 MΩ or more) under no-signal conditions.

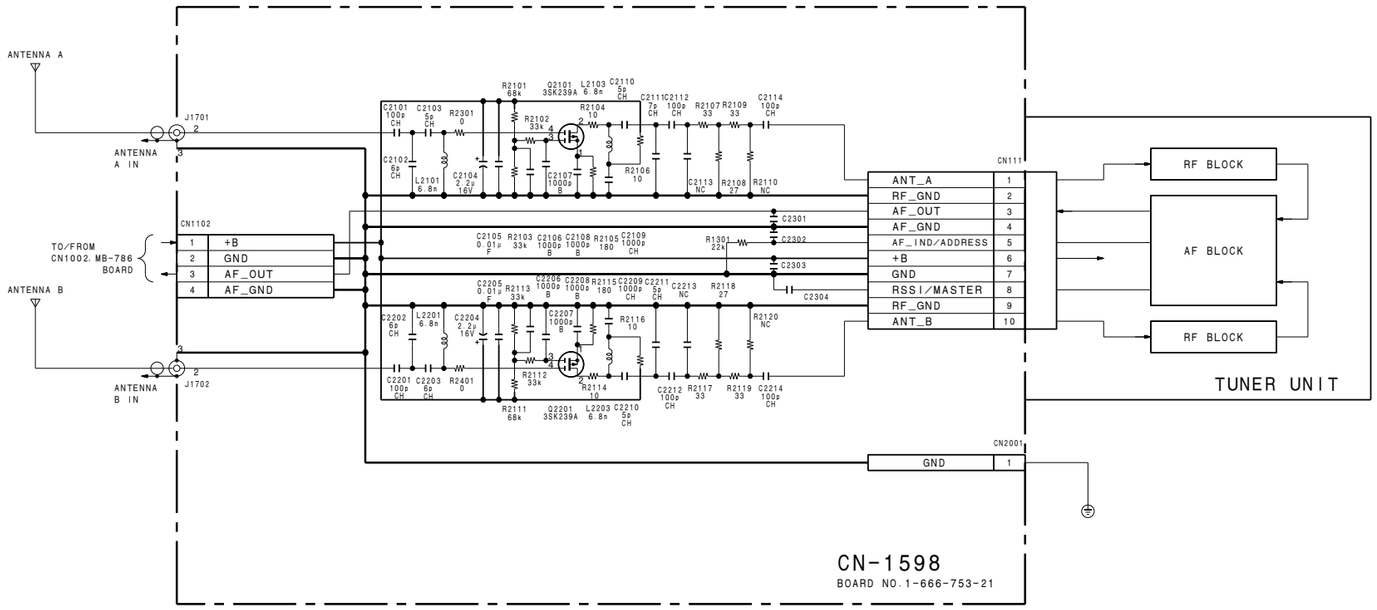


AF LEVEL DIAGRAM (MB-786 board)

Note:
- The AF level shows the value when the following reference signal is supplied to the ANTENNA A and B IN connectors from a SSG.
  RF : Level input 60 dBµ
  FM : ±5 kHz deviation at 1 kHz modulation

0 dBµ = 1 µV(at no load)
0 dBµ = −113 dBm(0 dBm = 1 mW, 50 Ω load)
0 dBu = 0.775 Vms

RE-157
BOARD NO. 1-666-755-21
VR-245
BOARD NO. 1-666-754-21
MB-786
BOARD NO. 1-666-752-21
WRR-800/800A
B-WRR800A-MB786/M



CN-1598
BOARD NO. 1-666-753-21
WRR-800/800A
B-WRR800A-CN1598/M

WRR-800A (AU) E
9-976-859-01

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